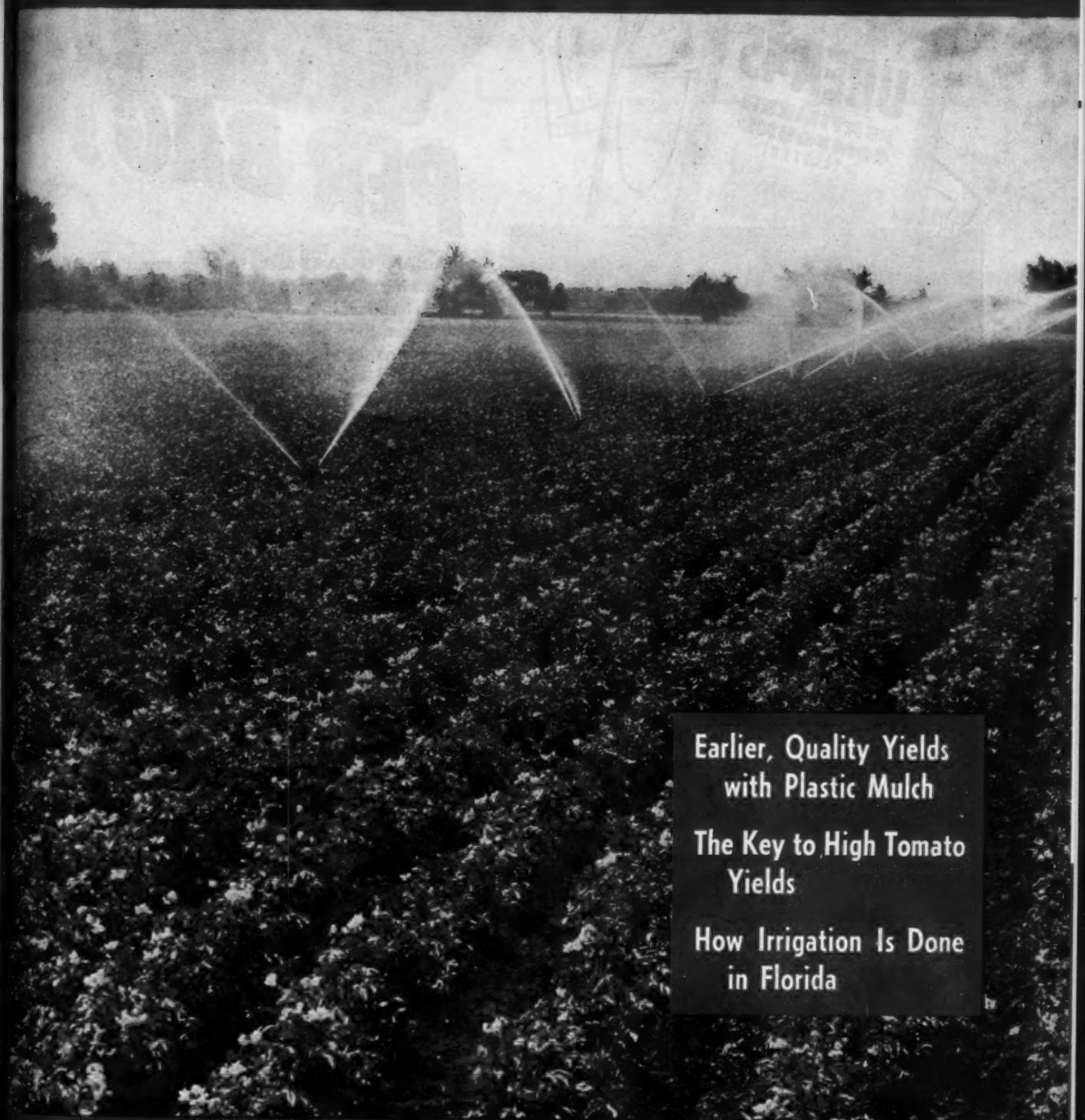
American Vegetable Grower

JUNE • 1956



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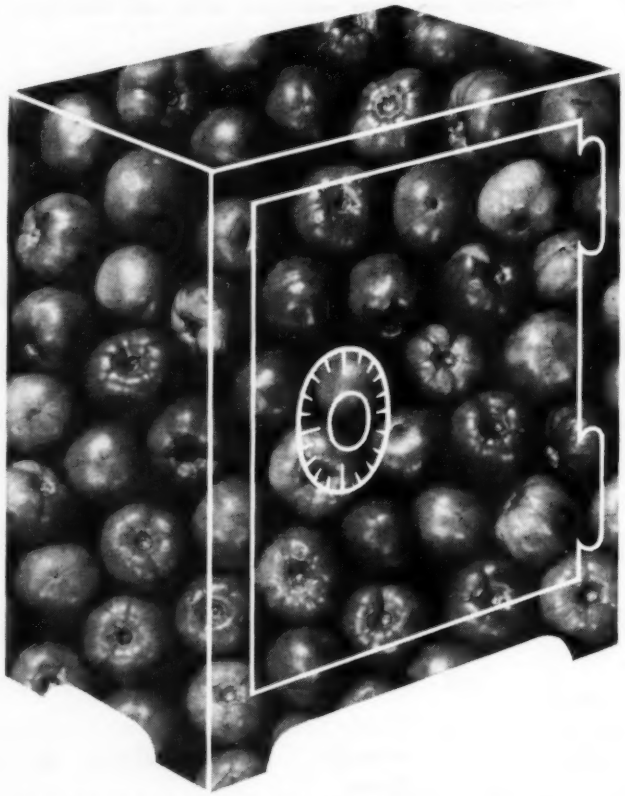

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AMERICAN

VEGETABLE GROWER

REG. U. S. PAT. OFF.
(Commercial Vegetable Grower)

Vol. 4 June, 1956 No. 6

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LETTERS TO THE EDITOR

One of the Finest

Dear Editor:

I will appreciate it if you will send me the current address of plant breeder Bill Tapley whose picture is in the March issue of AMERICAN VEGETABLE GROWER (article entitled, "Tomatoes and Squash . . . Made to Order").

I am sending you $1 for a one-year renewal. Please send me the April issue. I think that you have one of the finest magazines published.

Winona, Miss. Joe H. Morgan

We have sent our reader Professor Tapley's address and have renewed his subscription.—Ed.

Watermelon Wizard Writes

Dear Editor:

Thank you for the extra copy of the March issue in which the story about our place, "Watermelon Wizards of the North," appeared. I think Mr. Stratton did an excellent job of reporting, especially his handling of the technical side of the article.

The largest grower of watermelon seed in the country saw the article and sent me a pamphlet describing 101 different varieties of watermelon. From this list I expect to find a variety that will grow even bigger and better up North.

I hope that other readers of AMERICAN VEGETABLE GROWER will get as much help from this article as I have from similar articles in your magazine. One of the many helpful hints I got from your magazine was concerning the use of lime sulfur to prevent deer, rabbit, and mice damage to young trees. Of course, one season is not sufficient to draw definite conclusions, but so far lime sulfur is working as well here in New Hampshire as it did in Indiana.

Nashua, N. H. Ben Hogan

More on Plant Protectors

Dear Editor:

Pictured in the lower center of page 11, March issue, is a plant protector in place over a tomato plant. Mr. Banta evidently gives credit for the invention of this protector to the Metzler Orchard Company. Actually, it is evident that Mr. Colp or some of his co-workers have copied this from the original inventor, R. W. Griffith and Sons, one of the better tomato growers in the Cobden, Ill., area.

Mr. Griffith started using this plant protector about 1947 while both sons were students of mine in the Veterans' On-Farm training program at the Cobden high school. I thought perhaps it might be well to set the record straight.

I enjoy your magazine very much but feel better coverage of western operations might give eastern and midwestern growers some ideas that could be utilized in their enterprises.

Davis, Calif. John C. Lingle

Money In His Pocket

Dear Editor:

We learn so much and get so very much good from your magazine. It can mean more money in the farmer's pocket.

Hastings, Mich. Oscar Gigstead

NEW

Heavy-duty plastic tarps

Larvacover *made of* MONSANTO ULTRON Vinyl Film

steam soil sterilization

seed bed fumigation

light diffusion and insulation

Tougher, more efficient tarpaulins for large area covering are ready now to make money for nurserymen, vegetable growers and florists everywhere.

Larvacovers, tested by leading state universities, are recommended for low-cost soil sterilization, bulk soil fumigation, waterproofing of greenhouse benches, and light diffusion and insulation.

These heavy-duty, easy-to-handle tarps are made of Monsanto Ultron—a tough, waterproof, mildew-resistant vinyl film. They also resist deterioration when exposed to sunlight, severe weather conditions, fumigants and other agricultural chemicals.

Because Larvacovers have high gas retention, thorough fumigation is possible with a minimum use of toxic agents. Fuel can be saved on steam sterilization. A special Florist Green pigment has been added so Larvacovers can also be used effectively for controlled plant shading.

Larvacovers are supplied in both heavy-duty thickness and standard gauge. There is no fire hazard because the material is self-extinguishing. All standard sizes are carried in stock—custom sizes made to order. Ends have 2-inch hem for tear resistance and good grip in handling. Where seamed, Larvacovers are fabricated electronically with a full half-inch flat seam.

The Ultron vinyl film used in Larvacovers is made by the Monsanto Chemical Company, Plastics Division, Springfield 2, Mass. Mail coupon for full information.

MONSANTO

Larvacide Products, Inc. 179
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New York 6, N. Y.

Please send me, without obligation, descriptive literature and prices for new Larvacovers made of Monsanto ULTRON vinyl film. Also name of nearest dealer.

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Address_____

City_____ Zone____ State_____

McCormick 6-row beet, bean, and vegetable cultivator on the Farmall 300. A heavy-duty vegetable cultivator also is available.

You get CULTIVATING CONTROL UNLIMITED

Speed Control

In any gear, with Torque Amplifier, you can reduce tractor speed one-third for easy turns, then resume full-gear speed without shifting on Farmall 300 and 400.

... with Hydra-Creeper you get low-low speeds from 1/5 to 1 mph, plus the four regular speeds on Farmall 100 and 200.

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Merely loosen one setscrew to slide each one-piece clamp on the McCormick vegetable cultivator tool bar, then retighten to a vise-like grip.

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Only with a Farmall can you match tractor power to your particular vegetable crops and acreage so *exactly*. Five sizes of Farmall tractors—three also available in Hi-Clear models—provide these exclusive combinations of features for accurate, hoe-clean cultivation:

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Two-way hydraulic pressure lets you exert down-pressure on gangs and sweeps to maintain unmatched accuracy of cultivating depth.

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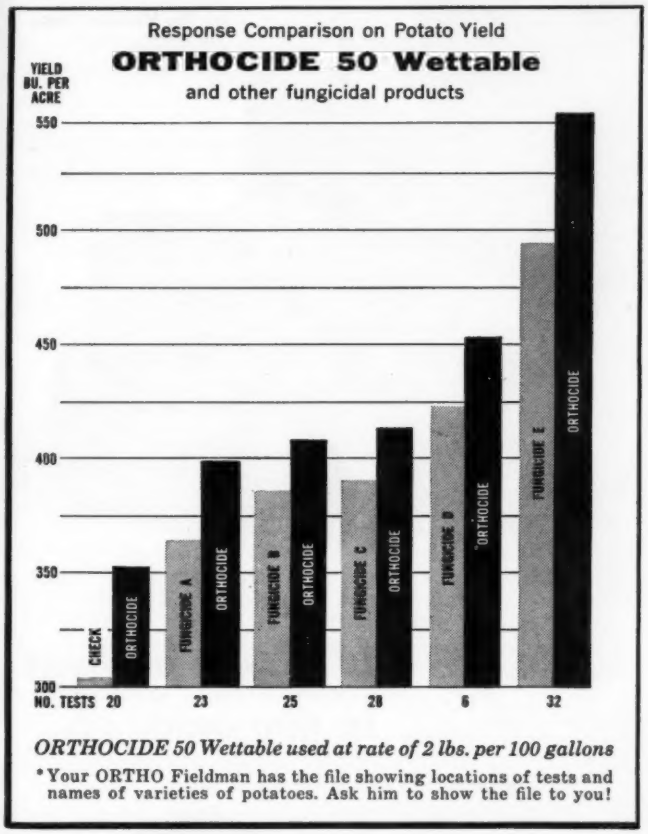
ORTHOCIDE 50 Wettable

(contains captan)

WINS FIRST PLACE

in potato and tomato fungicide comparison tests

Look at these results from 134 comparisons to ORTHOCIDE on 12 varieties of potatoes in 15 states and 3 Canadian provinces*



ORTHOCIDE 50 Wettable used at rate of 2 lbs. per 100 gallons

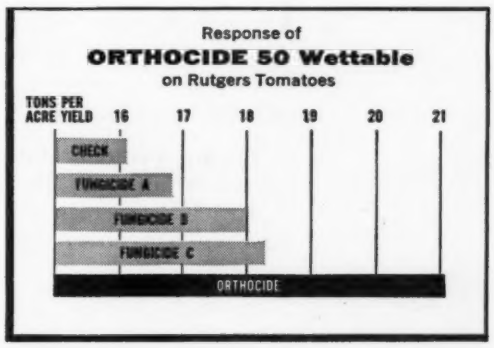
*Your ORTHO Fieldman has the file showing locations of tests and names of varieties of potatoes. Ask him to show the file to you!

See for yourself in the result chart at the left. ORTHOCIDE 50 Wettable proved superior to other fungicides tested.

When you use ORTHOCIDE (contains captan) it can be like "extra money" growing on your potato plants. To get that "extra money" *this crop year*—start an ORTHO program featuring ORTHOCIDE now.

Tomatoes, too!

ORTHOCIDE 50 Wettable increased yield nearly 3 tons per acre over copper 53; exactly 3 tons per acre over competitive fungicide #1; 4¼ tons per acre over competitive fungicide #2 and nearly 5 tons per acre over untreated plants.



Proof like this points the way clearly to greater profit from better yields of better quality tomatoes. Isn't that what you raise them for? Then *use* ORTHOCIDE!

ON ALL CHEMICALS, READ DIRECTIONS AND CAUTIONS BEFORE USE.
T.M.'S REG. U.S. PAT. OFF.: ORTHO, ORTHOCIDE.

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SCIENTIFIC PEST CONTROL

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"The polyethylene bag makes a better display in stores, and by that it increases the sales," testifies Ben Bosgraaf, marketer of celery, onions and carrots, Hudsonville, Mich.

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Cross section of snap beans grown without mulch and unirrigated (two at left) and with black plastic mulch and irrigated (right).

The Magic of PLASTIC MULCHES

They keep plants warm and soil moist, control weeds, and promote earlier maturity of better-quality crops

By E. M. EMMERT *University of Kentucky*

MULCHING has long been used to conserve moisture. Loose mulches conserve moisture, and if deep enough will control weeds.

However, they tend to lock nitrogen and to keep the ground cool and sometimes too wet and soggy if much rain occurs. They cannot be used for furrow irrigation and must be completely renewed each year. Of course, they add organic matter, but large acreages require immense amounts of such materials. Furthermore, spotting is not controlled too well.

Paper mulch proved to be fragile and costly, often rotting out before the season was up. Aluminum foil did not rot, but it was fragile and costly. While it reflected heat and kept even soil temperatures, it did not warm the soil, and after heavy rain broke up unless it was of a heavy gauge. Yet heavy gauges were too costly to be practical. It was difficult to lay, lasted only one year, and was difficult to remove.

The first attempt at plastic mulching was with clear polyethylene film. This forced vegetables quite well, but also forced weeds. They grew under it so well that they pushed the plastic out of the ground. Night soil temperatures were rather low and day temperatures quite high. The plastic lasted only one year.

Then came the trial that really paid off. Black polyethylene* was laid. It was easy to lay, kept the soil warm day and night, and the weeds did not have a chance. Furthermore, it lasted two years and is due to last two more years.

Beans and tomatoes planted through it early grew vigorously, while the check remained yellow and grew slowly in April and early May. Both bunch and Kentucky Wonder beans sold two weeks earlier for $4 and $5 a bushel, while the beans from the check plot had a hard time bringing $1 a bushel. The early yields were as much as 200 bushels more per acre.

Tomatoes also were much better quality than those grown in the check plot and gave a 40% increase in early fruits and a substantial total increase, despite plenty of rain. The returns paid for the plastic several times over, and if the weather had been dry, would have paid out many times over. In fact, it seems that the mulch can replace staking, since little or no spotting occurred where fruits or beans touched the paper.

Furrows about 6 inches deep were made and covered with 3 feet x 1½ mil black plastic, leaving 2 to 3 feet between strips. Both snap and pole beans were jobbed through the plas-

(*Continued on page* 28)

Kentucky Wonder beans coming up through slits in black plastic at Kentucky Agricultural Experiment Station. Moisture under plastic stays at least 10 days longer than in bare soil.

*Research on the use of black plastic is being liberally supported by the Bakelite Corporation, 30 E. 42nd St., New York 17, N.Y.

Irrigating a field of green beans on farm of John Martin, Brockton, N.Y. An inch of water per week was applied last summer to green bean crop.

Are You Planning to IRRIGATE?

Irrigation can double your yield and profit. Here are guides to help you develop an efficient system

By ELDON S. BANTA

FOUR basic questions must be answered satisfactorily before you install an irrigation system:

1) How many acres are you going to irrigate?

2) What will be the maximum acre-inches required in the driest season?

3) How much water do you have available?

4) What size and type of equipment will do the job best?

One never foresees all the problems beforehand, so from time to time you will need to recheck your system, making the changes necessary for increased efficiency and coverage. You will find new answers to some of these questions each year you irrigate.

How many acres to water?—The number of acres you irrigate depends upon the amount of water you have available and upon the amount of money you can invest in equipment.

Stephen Blodgett, who grows 1500 acres of Black Valentine beans for fresh market near Fishkill, N.Y., has been irrigating since 1946, but last year was the driest he has ever experienced. He had water available to cover around 400 acres and equipment to cover about that much. Many fields he could not reach, so the beans dried up and some were unharvested.

Now he is considering planting only those fields he can get to with water and his equipment, because he lost in a very dry year on his unirrigated acres what he made on the acres he watered. This year, of course, may be a different story. You have to balance your plan, keeping in mind that if you can satisfactorily irrigate all your vegetable acreage, you reduce the risk of loss in the very dry years.

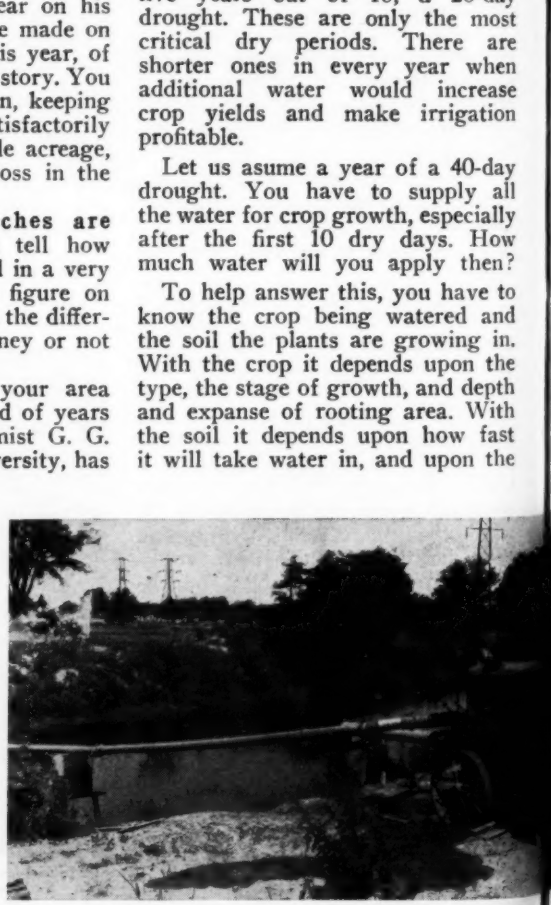
How many acre-inches are needed?—How can you tell how much water you will need in a very dry year? You have to figure on this, because it may mean the difference between making money or not from your irrigation.

Weather records for your area or your farm for a period of years are a big help. Agronomist G. G. Williams, of Purdue University, has made a study of weather records in his state.

He found that in one year out of 10 Indiana growers can expect a 40-day drought; in two years out of 10, a 30-day drought, and in about five years out of 10, a 20-day drought. These are only the most critical dry periods. There are shorter ones in every year when additional water would increase crop yields and make irrigation profitable.

Let us asume a year of a 40-day drought. You have to supply all the water for crop growth, especially after the first 10 dry days. How much water will you apply then?

To help answer this, you have to know the crop being watered and the soil the plants are growing in. With the crop it depends upon the type, the stage of growth, and depth and expanse of rooting area. With the soil it depends upon how fast it will take water in, and upon the



Stewart Christy, of Fredonia, N.Y., irrigates from spring-fed pond holding a half-million gallons. He uses a Hale pump powered by Chrysler industrial engine. Pond was built in 1947 at a cost of about $800.

Left—Yields ran 125 bushels or more per acre in irrigated Black Valentine bean field of Stephen Blodgett, Fishkill, N.Y. Four inches of water were applied last year; plants completely cover the middles of the rows.

Below—Plants were small and beans dried up in unirrigated bean field of Blodgett's, which went unharvested. Plants were set on same date as those at left.

character of its internal drainage.

Let us look at the 125 acres of Katahdin and Cobbler potatoes on the farm of H. R. Talmage, Riverhead, Long Island, N.Y. Last year on July 22 he was applying the sixth water application to his potatoes. He had been applying one inch of water every seven days because no rains had occurred since May. From 18 years of experience in irrigating potatoes, Talmage knows that his soil will take in water slowly, so he prefers sprinklers that deliver 15 gallons per minute (gpm) to larger ones. The fine "rain" does not puddle soil surface and cause it to seal over, letting water run off.

In this very dry year you see it takes pretty close to 3 million gallons of water for each application.

At Brockport, N.Y., John Martin grows several hundred acres of vegetables for processing. He started irrigating in 1949 and has watered each year since. Two main crops are green beans and tomatoes. Though grown on the same soil type, each has different water requirements.

Beans are shallow-rooted, so they take light water applications of one inch per week. Tomato roots go down 18 inches or more, so John puts on 1½ inches per application every 10 days. He uses 20 gpm sprinklers on both, watering the tomatoes for a longer time than the beans. How fast the soil takes in water determines to a large measure the size of sprinklers to use.

How's your water supply?—An unlimited water supply means you can irrigate all the land you want until some other factor limits you. But most growers find water supply a limiting factor.

John Martin siphons water from the Erie Barge Canal into streams and ditches on his farms for irrigating his 300 acres. For all practical purposes his water supply is unlimited.

Wells in a few areas supply almost unlimited water. The Schmidt Brothers, Paul, Bob, and Jim of Swanton, Ohio, pump water from a 275-foot well for their 270 acres of vegetables. Al Gerhart, of North Ridgeville, Ohio, uses a combination of well and ponds to supply water for his 90 acres. This is often a good way to make a small water supply go farther. A well of small capacity can be pumped more or less continuously into a large pond and the irrigation water pumped from it.

Stewart Christy, of Fredonia, N.Y., built a pond in 1947 which holds a half million gallons, and is spring-fed. His pond can be pumped almost empty, then fills up by the next irrigation time. He has storage capacity for applying an inch of water to about 20 acres.

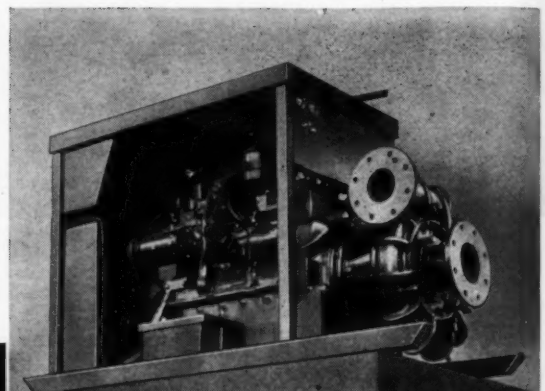
The ability for a pond to refill determines the acres you can expect

(*Continued on page 29*)

In very dry periods many growers water ground before seeding or setting plants. This western New York field is being watered before setting to cauliflower in 1955. Note pattern of sprinklers in period of low wind.

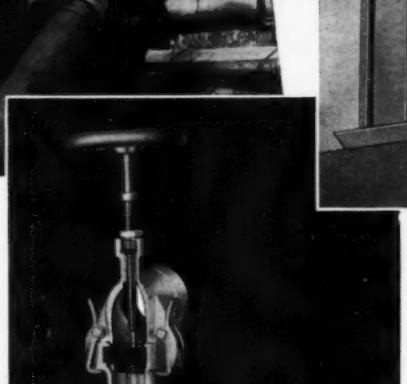
To Help You Select IRRIGATION equipment

Six-inch pump, Model 6E6S, of Marlow Pumps, Ridgewood, N.J., has Chrysler IND-32A engine, will handle 850 gpm at 100 pounds pressure. A mobile unit.



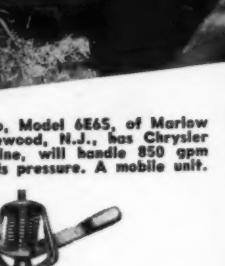
PFIR irrigation pumping unit made by Hale Fire Pump Co., Conshohocken, Pa., has flexible performance range from 600 gpm to 800 gpm.

Rain Bird 30-W sprinkler, designed for use with abrasive water, is made by National Rain Bird Sales & Engineering Corporation, Azusa, Calif.



Coupling-valve combination is made by PORTable ALUMinum Irrigation Co., Box 878, Vista, Calif.

Ireco coupler has gasket seal to protect tubing ends. Irrigation Equipment Co., Inc., Eugene, Ore.



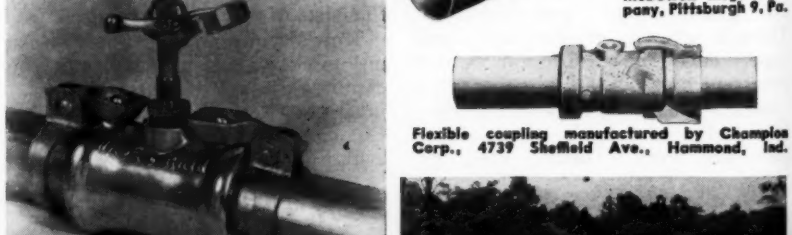
Skinner S-1000 sprinkler, of Skinner Irrigation Co., 146 Water St., Troy, O., is available in 7 nozzle sizes, from 10 to 42.4 gpm.

Automatic pressure lock is feature of coupling made by McDowell Mfg. Company, Pittsburgh 9, Pa.

Flexible coupling manufactured by Champion Corp., 4739 Sheffield Ave., Hammond, Ind.

Standard self-locking Wade Rain coupler, made by R. M. Wade & Co., 1919 N. W. Thurman St., Portland 9, Ore., fits all types of irrigation pipe.

Model 5 WHI irrigation pump with capacity of 950 gpm at 90 pounds pressure, made by Carver Pump Co., 1440 Hershey Ave., Muscatine, Iowa.



Mobile pumping unit, shown pumping water from pond, is made by The Gorman-Rupp Co., 305 Bowman St., Mansfield, Ohio, and features large drum-type fuel tank. 26 models in centrifugal pumps.

STATE NEWS

- **Mediterranean Fruit Fly Found in Florida**
- **New Virus Threatens Oregon Snap Bean Industry**

Mediterranean Fruit Fly

FLORIDA—Pest control authorities are again engaged in a campaign to eradicate the Mediterranean fruit fly from the Sunshine State. The unwelcome visitor was rediscovered near Miami in April, and by May 3 had been found as far north as Fort Lauderdale, but had not yet been found in the main commercial vegetable areas.

The State Plant Board swung into immediate action upon the discovery of the reinfestation and the USDA sent some of its most capable bug fighters to the area. A federal quarantine has been placed on the state.

The Medfly was first found in Florida April 6, 1929, and was eradicated in 18 months at an expenditure of $7,500,000 and the use of up to 5,000 men by State Plant Board and USDA forces. It was found on 1,002 properties in 20 counties at that time.

The Florida Agricultural Experiment Station's Watermelon and Grape Laboratory is being relocated on new land near Leesburg. The State Board of Control recently acquired 165 acres to provide new land and one location for the laboratory. Since 1929 the unit has had a laboratory in Leesburg and a farm 3 miles out. It has developed wilt-resistant strains of watermelons.—*J. Francis Cooper, Agr'l Editor, Gainesville.*

New Virus Attacks Beans

OREGON—A year ago plant pathologists discovered that the sudden death of nearly-mature Blue Lake bean vines was due to a new unnamed virus. They do not yet know how the virus enters the field or how it is spread from plant to plant. If the disease should become widespread, however, commercial production of Blue Lake beans could become impractical in many areas.

More than $10 million worth of snap beans were grown in Oregon for processing last year and most of these were of the Blue Lake type. The American Can Company for the second year is financing a research project so that the Oregon State College scientists as well as the USDA can study the new virus in detail.—*Harold and Lillie Larsen.*

Potato Promoter Resigns

NEW YORK—The New York Seed Potato Association, Inc., announces the resignation of H. J. (Red) Evans, who has held the position of manager for the past 26 years. He will now go into the marketing of seed and table stock potatoes on his own.

Under his direction the association became the first in the state to develop the consumer-sized package and label it as to grade and size. The first number used under the "Empire State" label was issued to the association, and the designation "A-1" still is registered as its property.

ANNUAL VGAA REPORT

The 1955 Annual Report of the Vegetable Growers Association of America has been released by the VGAA. It is a valuable up-to-date reference text for the vegetable industry, and includes all major papers presented at the annual convention as well as the officers' reports. Copies may be obtained by sending $2 to the Vegetable Growers Association of America, 528 Mills Bldg., 17th and Pennsylvania Ave, N.W., Washington 6, D. C.

Evans served for many years as president of the Empire State Potato Club, and sparked several promotions of New York potatoes, representing the club and various state agencies. He will still act as editor of its official monthly news letter, "Potato News."

Marion (Slim) Meadows has left Cornell University to accept a position with the Grange League Federation. He will do research throughout the state on weed control problems for the G.L.F.

Dr. Robert Kunkel, potato research specialist from Colorado, has joined the Vegetable Crops staff of Cornell University as a replacement for Dr. Ora Smith, who is on leave with the National Potato Chip Institute.—*P. A. Minges, Dept. of Veg. Crops, Ithaca.*

Sweetpotato Research

LOUISIANA—The Louisiana Sweet Potato Association during its recent 19th annual meeting, asked that more funds be devoted by the horticultural research department at Louisiana State University and the Southern Regional Laboratory at New Orleans to research into new uses for lower grade but sound sweetpotatoes. In flakes, flour, pre-peeled, chips, frozen fresh and cooked, and dehydration, are some of the possible outlets.

R. J. Castille is the new president of the association, headquarters of which are at Opelousas.

Greenhouse Growers Meet

OHIO—Paul B. Ruetenik, owner and operator of Ruetenik Gardens, Vermilion, was re-elected to his third term as president

(*Continued on page 27*)

Know Your . . . VEGETABLE SEEDS

BY VICTOR R. BOSWELL
U.S. Department of Agriculture

CUCUMBER

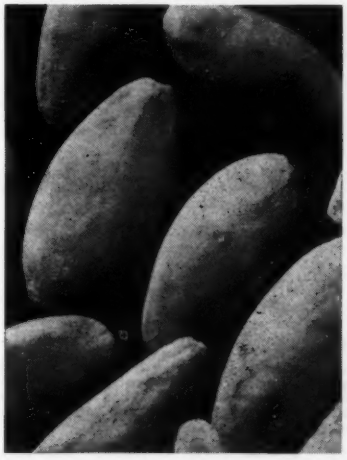
SEEDS of cucumber are true seeds with no attached parts. To the naked eye they appear perfectly smooth, but when magnified they are seen to have very fine grooves and ridges lengthwise of their surfaces. The seeds are relatively long-lived among vegetable seeds.

The area of cucumbers grown for seed annually has varied in recent years from about 1500 to more than 6000 acres, and production has varied from less than a half million to about 1½ million pounds. Yields average 250 to 350 pounds per acre.

Since the seed is recovered from fleshy fruits, an arid climate is not essential to good maturing and harvesting of the crop. Nevertheless, much of it is produced under irrigation in California and Colorado. Important amounts, especially of the pickling type, are also grown in Michigan and other northern states.

Generally, the seed is "threshed" from windrows of the ripe fruits in an extractor that is driven through the fields. The pulp that adheres to the seeds is removed by fermentation in barrels for three or four days; by forceful washing and agitation by mechanical means; or by digestion with weak acid or alkali followed by thorough washing. The last two methods require only a few hours. All methods are followed by prompt drying to a safe moisture content, either in the sun and wind or by artificial dryers.

Increasing amounts of F_1 hybrid cucumber seed are being produced commercially. Hybrid seed is necessarily expensive because of the hand labor required to remove the male blossoms from the female parent which is interplanted with rows of the male parent. Bees are the chief pollinators. Isolation of a quarter mile or more is required to prevent undesired cross-pollination.



Answering Your QUESTIONS

Don't let your questions go unanswered. Whether large or small, send them with a three-cent stamp for early reply to Questions Editor, AMERICAN VEGETABLE GROWER, Willoughby, Ohio.

ONION QUESTIONS

What kind of onion variety should I try in the hybrid line that will give good results in our locality on muck? Also, what sweet onion variety and what varieties of red and white onions would be best?—*Indiana.*

The new hybrid onions that have done well in northern Indiana are Elite, Abundance, and Brown Beauty, all of the Yellow Globe type. Dr. Kent Ellis of Purdue University advises that the Sweet Spanish type of onion will grow in northern Indiana but that the Bermuda type will not produce a satisfactory crop. Of the Sweet Spanish type, Yellow Sweet Spanish sometimes makes outstanding yields, and one of the newer hybrids, such as the Y-41, is of this type. The Southport Red Globe and the Southport White Globe are still the standard varieties of red and white onions.

CONTROL FOR STEM BORERS

What insecticide should I use to control stem borer in squash and pumpkin?—*Ohio.*

Four per cent rotenone is recommended as a spray at the rate of 6 pounds per acre. Other recommended spray applications are: purified DDT, methoxychlor, parathion or malathion. Apply these materials five times, at weekly intervals beginning the last week of June, at the base of the plant.

MUSKMELON PROBLEM

Can you tell me why I have so many "slickers" in my muskmelons. The soil is black sandy loam, I irrigate and fertilize, and the soil test shows pH 5.8.—*Wisconsin.*

Some muskmelon varieties are more prone to smoothness than others. Anything causing defoliation will result in maturity of fruit before netting has developed. Also, high soil nitrogen, poor soil drainage, low potash, too rapid maturity in hot weather may cause this difficulty with many eastern-grown varieties. Low soil potash and high soil pH has caused this trouble, but pH 5.8 is not high enough to be harmful.

TOMATO VARIETIES

Where can I get seed of the Longred, Red Jacket, Red Top, etc. mentioned in your story about Dr. Tapley?—*Rhode Island.*

The Associated Seed Growers, Inc., 205 Church St., New Haven, Conn., lists Longred and Red Top and may be able to supply the others.

WEED SPRAY FOR BEETS

I am interested in knowing if there is a weed spray program for red table beets. We use saturated water and salt solution but it is only a selective weed killer for us out here.—*Washington.*

Try TCA at about 8 pounds per acre which, according to Michigan State University, will not injure table beets. However, TCA is only selective for annual grasses and will not control broadleaved weeds. Dichloro urea is also a weed killer for annual grasses and can be purchased from the Carbide and Carbon Chemical Co., 30 E. 42nd St., New York 17, N. Y., under the name DCU-77.

More quality tomatoes are produced when starter solution and fertilizer are used and moisture is maintained.

How to *Double* TOMATO YIELDS

By EDWIN O. HAROLDSEN

Utah State Agricultural College

TOMATO yields have been greatly increased in Utah by using starter solutions and keeping irrigated plots moist throughout the growing season.

Dr. Alvin R. Hamson, associate professor of horticulture at Utah State Agricultural College, reports the following results of experiments conducted at Farmington.

Plots maintained at low soil moisture (with growth consequently retarded) yielded 15 tons of tomatoes per acre.

Plots which were allowed to dry out somewhat between irrigations yielded 19.3 tons to the acre.

Moisture Ups Yield

Plots kept moist through the growing season so that tomatoes were not stunted from lack of moisture yielded 27 tons to the acre.

The first plot received two irrigations during the season; the second received five, and the third, eight.

In the experiment 600 pounds of treble superphosphate was drilled 4 to 6 inches deep before the plants were transplanted. In addition, differing amounts of nitrogen were applied as a side-dressing two weeks after the plants were transplanted. Another treatment was applied six weeks after transplanting.

None of these side-dressings—nor a late side-dressing of nitrogen—influenced yields particularly. However, the application of starter solution gave a substantial boost in yield.

Half the plots in one experiment were planted with starter solution applied to the young plants. The other half received no starter solution.

This starter fertilizer differs from the main application of fertilizer in that it is entirely soluble in water. It was applied in a dilute solution (5 to 7 pounds dissolved in 50 gallons of water) at the rate of about one cup per plant. The particular brand used in this experiment was a 10-52-17 starter fertilizer.

Starter Solution Beneficial

Starter solution is most beneficial in stimulating early root development and quick recovery of transplants.

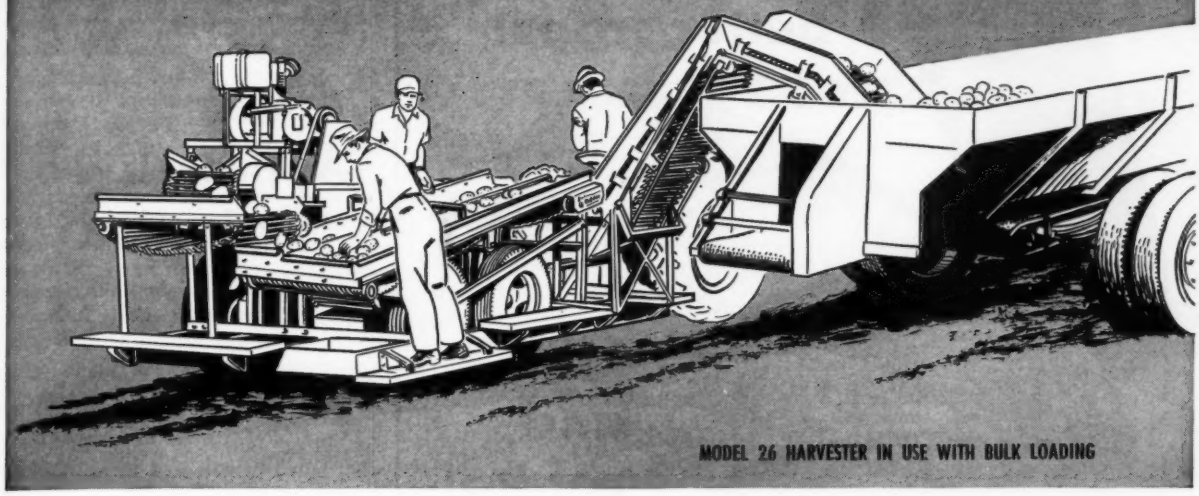
A considerable increase in total yield was obtained in this experiment where starter solution was applied. Tomato plants receiving the starter solution yielded 4.6 more tons to the acre than the plants receiving no starter solution.

Dr. Hamson recommends that approximately 600 pounds of treble superphosphate be drilled deeply before transplanting the tomatoes and that approximately 80 pounds of actual nitrogen be applied per acre. Starter solution should be used when transplanting.

"Where irrigation is available every effort should be made to keep the tomatoes moist throughout the season in order to get highest yields," suggests Dr. Hamson. Not only do these practices give high yields, but when the tomatoes were graded, a higher percentage of No. 1 tomatoes was produced at the higher moisture levels and with the better methods of fertilization. THE END.

John BEAN POTATO HARVESTING

...the proven way to bigger potato profits



MODEL 26 HARVESTER IN USE WITH BULK LOADING

REDUCE YOUR LABOR COSTS 50%—OR MORE!

Growers using John Bean Potato Harvesters have cut their labor costs in half — and see potential cost reductions of up to 75%. They're comparing their previous methods of hand digging, picking and loading with John Bean mechanical indirect harvesting and bulk loading. With the somewhat slower method of direct harvesting, labor costs are still reduced appreciably.

Profitable operation with John Bean Harvesters is not limited to the large growers — it's been proven that farms with 30 acres or more, or neighbors combining acreage, can profit substantially.

ELIMINATE TRANSIENT LABOR PROBLEMS

No longer need growers be concerned with the difficulties of obtaining, supervising and housing large crews. John Bean Harvesters have replaced 30 to 40 pickers and allowed growers to use only their regular force. The faster, easier operation helps keep good men, too. John Bean Harvesters have independent power units that do not rely upon tractor PTO, so that apron speeds can be regulated easily to grounds speeds for better teamwork and maximum output. Digger and bulkloader are hydraulically controlled.

PRODUCE A BETTER, CLEANER, MORE MARKETABLE CROP

John Bean Harvesters give you the most complete separation of potatoes from stones and clods of any equipment on the market. Many growers say they get far less damage from cuts and bruises than with hand digging, because the potatoes are picked up and dropped fewer times. You gain closer control over the quality of your crop and better opportunity for top prices.

JOHN BEAN MODEL 26 POTATO HARVESTER
is the field-proven, heavy-duty equipment for one-row direct or two-row indirect harvesting. Has 26" elevating conveyor and 30" sorting table.

JOHN BEAN MODEL 60 POTATO HARVESTER
especially designed for two-row direct harvesting, or four-row indirect. Has 60" elevator and 36" sorting table.

See your John Bean dealer for details on this profit-making equipment or write for catalog

fmc **John BEAN**

Lansing 4, Michigan · San Jose 1, Calif.
Div. of Food Machinery and Chemical Corp.

NO MITES mean better crops!

kill and control mites with

ARAMITE

There's more money for you from better crops. A small per-acre investment in Aramite can make a big dollar difference. Year after year, field results nationwide prove the bigger and better yields you can expect with Aramite—the safest, best-known mite-killer today.

Aramite gives outstanding control of most mite species including Two-Spotted, Atlantic, and European Mites. Equally effective on melons, citrus, corn, tomatoes, apples, peaches, and ornamentals. It is compatible with most insect and fungus-killing chemicals, has longer residual activity and is non-hazardous to humans and animals.

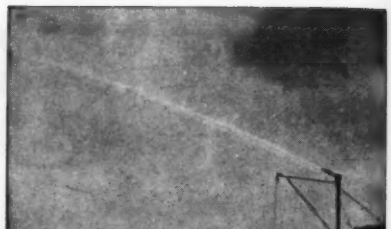
For more than 19 fruit and vegetable non-fodder crops, including lima beans, the Miller Amendment (Public Law 518) has approved Aramite with a tolerance established of one part in a million.

United States Rubber

Naugatuck Chemical Division

Naugatuck, Connecticut

producers of seed protectants, fungicides, miticides, insecticides, growth retardants, herbicides: Spergon, Phygon, Aramite, Synklor, MH, Alanap, Duraset.



Tractor-mounted pump and spray nozzle operating from shallow well in the Homestead area.

Florida's Approach To Irrigation

Florida gets 52 inches of rain per year but growers still irrigate!

SINCE 1934 the vegetable area under irrigation in Florida has more than tripled. Florida's average annual rainfall of 52 inches is poorly distributed over the 12 months. Most rain falls from June to September when few vegetables are grown in Florida, and the rest is sparsely and irregularly distributed over the fall, winter, and spring growing seasons when it is most needed.

Irrigation in Florida is supplemental, applied only when rainfall is insufficient. This condition may arise only one year in three in some areas of the state, but when the need arises the water and equipment must be ready or losses may be disastrous. Since a suitable water supply is seldom a problem with Florida's many lakes and canals, supplemental irrigation is attaining greater favor than ever.

Several years of tests in Florida indicated that the water table in the peat and muck soils of the Everglades vegetable area should be held within 1.5 to 2.0 feet of the surface. This

Pumping irrigation water from a shallow well into a main ditch. Smaller lateral ditches distribute the water to all sections of the field.

may be maintained by ditch or sprinkler irrigation, but water must be immediately available when rainfall fails. Amounts and times of application are thus best determined for local areas and specific, seasonal conditions.

An advised general rate of watering through combined rainfall and irrigation is one-half inch of water every six days. This rate varies somewhat with the age of the crop, the specific crop, and the drying conditions of the atmosphere.

Avoid Excessive Irrigation

Excessive irrigation, especially on the Arredondo sandy loam which is Florida's second type of vegetable growing soil, causes yield decreases. This is due largely to nutrient leaching. Excessive irrigation may also encourage plants to root near the surface. Such shallow-rooted plants suffer easily from drought if the heavy irrigation is not maintained.

On the muck and sandy soils cabbage, sweet corn, snap beans, onions, tomatoes, and cucumbers do well with supplemental irrigation, though yields vary somewhat from year to year with rainfall variations. Of the above crops, only the tomato yields well under conditions which tend toward droughtiness. This is due to the greater ability of tomato roots to penetrate deeply into the soil for moisture when surface layers become dry. Onions essentially lack this ability, and the other crops are intermediate.

Transplanting losses of cabbage and onion and tomato plants are reduced if supplemental irrigation is available. Even nitrogen side-dressing to vegetables results in the greatest good when soil moisture levels are maintained by irrigation.—*Paul E. Zopf, Jr., University of Florida.*

ADVANCE MATURITY OF SWEET CORN

PACIFIC Northwest sweet corn growers are advancing the maturity date of late-planted sweet corn seven to 10 days by using phosphorus in the fertilizer mixture at planting time.

To avoid fertilizer burn, not more than 40 to 50 pounds of actual nitrogen per acre should be included in the mixture at planting time. From 80 to 120 pounds of actual phosphorus per acre in a good range.

No significant yield increases have been noted when potash is included in the mixture under conditions in the Willamette Valley. However, some processors believe that potash adds quality, and include moderate amounts of it in their fertilizer recommendations to growers.—*Harold and Lillie Larsen.*

measure the difference

in CA
TRACTION BOOSTER farming

Here's a tractor that's making friends by the thousands among power-wise farmers everywhere — the two-plow Model CA with its wide selection of modern, low-cost, mounted implements.

You can measure the difference in . . .

LOW price. CA Tractor is priced ready to go—complete with BIG-4 power conveniences, foot brakes, hydraulic system, power take-off, belt pulley, starter, lights, etc.

LOW upkeep costs. Sealed-in lubrication — no daily greasing; anti-friction bearings throughout; powerful 4-cylinder engine with heavy replaceable cylinder sleeves.

LOW fuel consumption — made possible by the automatic TRACTION BOOSTER system that increases traction on drive wheels as needed . . . saves fuel and tire wear.

LOW implement prices. Mounted, hydraulically lifted implements are constructed of lightweight, high-strength steels — cost less, last longer.

And only the CA Tractor in its power class — at any price — gives you all of these BIG-4 features: (1) Automatic TRACTION BOOSTER system, (2) Power-Shift rear wheel spacing, (3) Two-Clutch power control for PTO harvesting, (4) SNAP-COUPLER hitch for minute-mounting of implements.

These differences bring complete power farming, in its simplest and most advanced form, to power-wise vegetable growers everywhere. See your Allis-Chalmers dealer today.

ALLIS-CHALMERS, FARM EQUIPMENT DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

TRACTION BOOSTER and SNAP-COUPLER are Allis-Chalmers trademarks.

CA Tractor and deep-working coil-shank cultivator.

Keeping Day-to-Day Irrigation Costs Down!

Important Factors To Consider Before Buying

LABOR COSTS • PUMPING COSTS • DEPRECIATION • SAFETY CONTROLS

First There Are Labor Costs

These may well be your highest single expense in the operation of an irrigation system. Plan your layout from the start for efficient pipe handling to keep this cost to a minimum. Check your layout carefully before you buy a system. It takes time to move pipe. A small amount of time saved on each move, when multiplied by the number of moves per season, can make a big difference in your earnings. As you consider different systems, ask yourself "Which layout does the best overall job with the least amount of labor?" Let your Marlow dealer help answer this question. He can offer you the experience of planning hundreds of irrigation systems, many of which will have been for land similar to yours.

In planning your flood irrigation system, minimize your labor requirements by careful layout of main ditches.

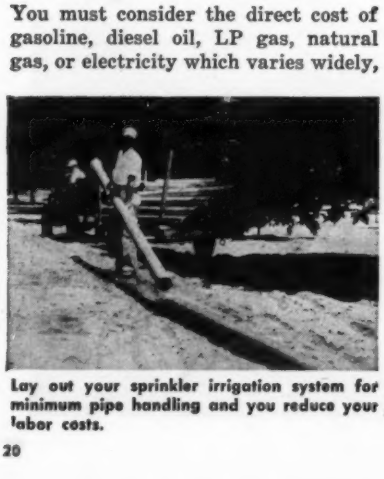
Then There Are Pumping Costs

You must consider the direct cost of gasoline, diesel oil, LP gas, natural gas, or electricity which varies widely, as you know. Find out the cost per horsepower for each of these in your area . . . and make sure that your pump is driven by the cheapest. Perhaps you can use a power-take-off on equipment you already have.

Even after you start pumping, the cost of moving water to the roots of whatever you grow can vary greatly. If your pump is not efficient or is not properly used, most of your power dollar will never splash on a plant. On the other hand, a good pump . . . properly matched to your system . . . will let your crops soak up most of your power dollar.

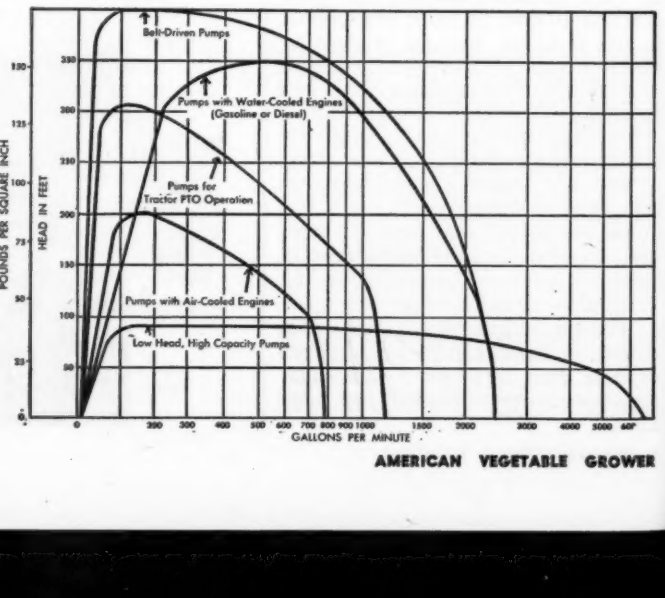
Frankly, the effectiveness of a pump depends on (1) quality of design and (2) on where in its operating range it is used. Of course, your pump must be run at the point where it delivers the right capacity and pressure to your system. Therefore, you must make sure that you have a pump that is using your cheapest power and is operating at or near maximum efficiency when it is delivering the capacity and pressure *your* system needs.

To make sure that all your power dollars are turned to water, Marlow



Lay out your sprinkler irrigation system for minimum pipe handling and you reduce your labor costs.

The various lines of standard Marlow pumps cover these ranges of pressure and capacities under reasonable continuous duty operating conditions.


Belt-Driven Pumps
Pumps with Water-Cooled Engines (Gasoline or Diesel)
Pumps for Tractor PTO Operation
Pumps with Air-Cooled Engines
Low Head, High Capacity Pumps
POUNDS PER SQUARE INCH
HEAD IN FEET
GALLONS PER MINUTE

offers the widest choice of irrigation pump types and sizes available anywhere. From this broad selection you can be sure that your Marlow dealer can offer you one or more models which will operate your system competently ... while operating with maximum economy.

Depreciation Is Important Too

Handle your pipe, sprinklers, and couplings gently, keep them clean, and they will last almost indefinitely. However, keeping a pump and its power unit clean and lubricated is *not* enough. If the power unit must be overloaded or overspeeded to deliver the capacity and pressure your system needs, it will rapidly depreciate with many unnecessary repair bills and much lost time from irrigation.

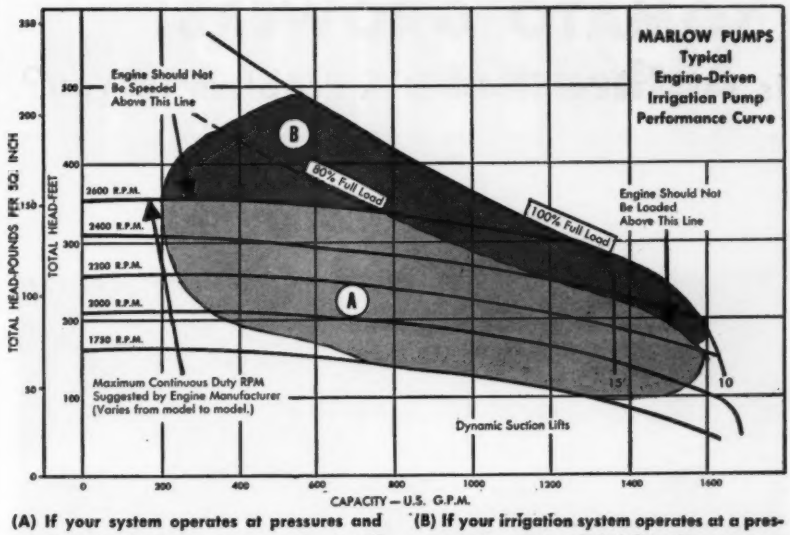
Make sure that the power unit of your irrigation pump is operating under a reasonable load, when the pump is delivering the performance your system needs. It should operate at no more than 80% of maximum engine capacity, and its speed should not exceed the manufacturer's recommendation for continuous duty operation.

Every engine-powered Marlow pump is mounted on a power unit which has ample power to operate the pump at rated capacity without overloading or overspeeding. We strongly recommend that no pump be selected for a system when its power unit must be run under a heavier load than suggested above. Instead, we suggest a larger pump and power unit.

In this way, when you buy a pump you buy a power reserve that will insure you of moderate depreciation with many years of satisfactory operation.

Finally, Make Sure That Operation Is Easy

Before you buy, think about operating your system. This can be simple, or it can be the source of many irritating interruptions. When operating, only one part of the system will require attention. That is the pump. Like any piece of power equipment, it requires fuel, lubrication, regulation, and supervision. If it is provided with the proper fittings and controls, operation will be automatic with no attention on your part. In the table on the right is a list of equipment which will make operation easy. The safety controls regulate and protect your investment. They make it possible to operate your pump unattended. Safety controls are the cheapest and best insurance you can have on an irrigation pump. High engine temperatures, low oil pressures, or water failure can damage your power unit extensively. All but the smallest Marlow pumps are guarded against each of these with appropriate safety devices ... at no extra cost.



(A) If your system operates at pressures and capacities in this area, your power unit will have ample capacity to perform without overloading or overspeeding. Under these conditions, your pump and power unit will run easily with years of satisfactory service.

(B) If your irrigation system operates at a pressure and capacity which fall in this area, you will be drawing on the power unit's reserve right from the beginning. Much faster depreciation will be the result. You should have a larger pump and power unit.

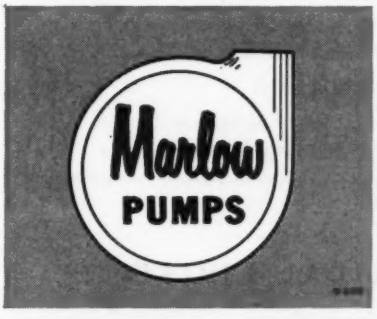
MARLOW ENGINE-DRIVEN IRRIGATION PUMP LINE

Equipment Supplied On "Standard" Units

PUMP DISCHG. SIZE	1½", 2"	2", 3"	3", 4"	4"	4", 6"	6"
ENGINE MAKE	Briggs & Stratton		Wisconsin	Willys	Chrysler	GM Diesel
FEATURES						
Standard Construction						
Priming Mechanism	—	YES	YES	YES	YES	YES
Discharge Check Valve	—	YES	YES	YES	YES	YES
Threaded Suction & Dischg.	YES	YES	YES	YES	YES	YES
Strainer Supplied	—	YES	YES	YES	YES	YES
Base Mt. or Wheel Mt.	YES	YES	YES	YES	YES	YES
Skid Mt. Available	—	—	YES	YES	YES	YES
Starting Method	ROPE	ROPE	CRANK*	ELECTRIC	ELECTRIC	ELECTRIC
Fuel Tank Supply	YES	YES	YES	YES	YES	—
Std. Safety & Control Devices						
Pressure Gauge	—	YES	YES	YES	YES	YES
Water Failure Cut-out Switch	—	YES	YES	YES	YES	**
High Head Temperature Cut-out Switch	—	—	YES	NOT NEEDED	NOT NEEDED	NOT NEEDED
High Water Temperature Cut-out Switch	NOT NEEDED	NOT NEEDED	NOT NEEDED	YES	YES	YES
Low Oil Pressure Cut-out Switch	***	***	YES	YES	YES	YES

*ELECTRIC START IS AVAILABLE AT EXTRA COST. **AVAILABLE AT EXTRA COST. ***NOT POSSIBLE WITH B. & S. ENGINES.

This chart shows the accessories and controls supplied as "standard equipment" with Marlow pumping units. Make sure that your pump is fully equipped. If it is, both installation and operation will be simplified.



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Division of Bell & Gossett Company

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See Your Marlow Dealer

He is an irrigation specialist who can help you produce better crops at a better profit. Upon request we will be glad to forward literature on Marlow pumps. As the leading manufacturer of sprinkler irrigation pumps, Marlow offers an exceptionally broad line. Pumps are available in many different types. This includes: gasoline, diesel or LPG engine powered pumps, electric motor driven units, pumps for belt drive from any auxiliary power source, and models designed particularly for connection to your tractor. Your Marlow dealer can select the exact pump for your specific needs. See him today.

TOMATO GROWERS!

Is **Anthracnose** A Problem To You?

NEW VANCIDE Z-65

Gives A Superior Measure of Control

Leading tomato growers who for several seasons have been using Niagara Vancide Z-65 report the top yields in their areas, *grading up to 90 per cent No. 1's.* They also report Vancide Z-65 to be the most outstanding fungicide ever developed for the control of anthracnose, early blight, septoria and certain minor tomato diseases.

In areas where anthracnose is prevalent growers will welcome this new Niagara product. It's been proved most effective in the control of this costly problem disease. Prove to yourself, this season, the merits of Vancide Z-65. Buy from your Niagara dealer.

POTATO GROWERS

Vancide Z-65 also provides excellent control over early blight and other potato diseases.

Niagara CHEMICAL DIVISION

FOOD MACHINERY & CHEMICAL CORPORATION

Middleport, N.Y., Pine Bluff, Ark., Richmond, Calif., Jacksonville, Fla., Tampa, Fla., Pompano, Fla., Wyoming, Ill., New Orleans, La., Ayer, Mass., Harlingen, Tex., Yakima, Wash., *Canadian Associate:* NIAGARA BRAND SPRAY CO., LTD., Burlington, Ontario

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IRRIGATION BULLETINS

[a]Available to residents of state only.
[b]Single copies free.
[c]Charge to non-residents of state only.
[d]Charge for everyone.

Because many of these bulletins are printed in limited numbers, readers are asked to contact their home state's extension service first. Also recommendations frequently vary from state to state according to local conditions.

Alabama

Water Resources and Supplementary Irrigation Workshop.
Extension Service, Alabama Polytechnic Institute, Auburn.

Arizona

Report No. 106—Suggested Construction Methods and Specifications for Concrete-Lined Farm Irrigation Ditches.[a]
Circular 127—Fitting Cropping Systems to Water Supplies in Central Arizona.[a]
Circular 205—Water Management.[a]
General Bulletin No. 246—The Cost of Pumping Irrigation Water, Pinal County, 1951.[a]
General Bulletin No. 250—Sprinkler Irrigation.[a]
Director, Arizona Agricultural Experiment Station, Tucson.

California

C 404—Irrigation Wells and Well Drilling.
C 408—The Border Method of Irrigation.
C 415—Irrigation Pumps, Their Selection and Use.
C 418—Concrete Pipe for Irrigation.
C 438—Grading Land for Surface Irrigation.
C 440—Contour Planting and Irrigation on Moderate to Steep Slopes.
X 158—Control of Aquatic and Ditchbank Weeds.
X 177—Irrigation Methods to Conserve Soil and Water on Steep Lands.
Agricultural Publications, Room 22, Giannini Hall, University of California, Berkeley 4.

Florida

Bulletin No. 378—Water Control in the Peat and Muck Soils of the Florida Everglades.[a]
Bulletin No. 495—Irrigation and Other Cultural Studies with Cabbage, Sweet Corn, Snap Beans, Onions, Tomatoes and Cucumbers.[a]
Bulletin No. 565—Tests of Low Head, High Volume Farm Pumps.[a]
University of Florida, Agricultural Experiment Station, Gainesville.

Georgia

Irrigation of Vegetable Crops.[b]
Irrigation Research in the Southern States.[b]
Designing Sprinkler Irrigation Systems.[b]
Georgia's Progress in Irrigation.[b]
Irrigate for More Profits.[b]
Agricultural Extension Service, University of Georgia, Athens.

Indiana

No. ID-6—A Guide for Designing Sprinkler Irrigation Systems.[b]
Agricultural Publications Office, Room 205, AES Bldg., Purdue University, Lafayette.

Kentucky

Extension Circular 528—Irrigation in Kentucky.[b]
Bulletin Office, Agricultural Experiment Station, University of Kentucky, Lexington.

Louisiana

Bulletin No. 1180—Irrigation on Louisiana Farms.[a]
Available at any County Agent's office or at Louisiana State University, Div. of Agricultural Extension, Baton Rouge.

Maryland

Fact Sheet 71—Irrigation in Maryland.
Extension Service, University of Maryland, College Park.

Massachusetts

Extension Leaflet—Irrigation for Massachusetts Farms.[a] 5 cents.
Extension Service, University of Massachusetts, Amherst.

Michigan

Bulletin No. 324—Fertilizing Through Irrigation Water.
Bulletin No. 327—Frost Protection with Sprinkler Irrigation.
Supplemental Irrigation in Michigan.
Co-operative Extension Service, Michigan State University, East Lansing.

Mississippi

Cut Irrigation Costs.[b]
Mississippi Agricultural Extension Service, State College.

New Jersey

Guide for Design and Operation of Sprinkler Irrigation Systems in New Jersey.
U. S. Department of Agriculture, Soil Conservation Service, State Office, Box 670, New Brunswick.

New Mexico

Circular 253—Low-Cost Irrigation Structures.[b]
M-2—Irrigation Pumps, Initial and Operating Costs.[b]
Research Report 4—Cost of Producing Crops on Pump-Irrigated Farms in the Estancia Valley, N.M., 1954.[b]
Bulletin 281—Effect of Irrigation Practices on the Growth and Yield of White Grano Onions.[b]
Bulletin 205—The Effect of the Frequency of Irrigation on Potatoes Grown in Mimbres Valley, N.M.[b]
Simple Soil Test Tells When to Irrigate.[b]
Extension Service, New Mexico A & M College, State College.

New York

Bulletin 862—Potato Irrigation.[c] 20 cents.
Bulletin 876—Yield, Tuber Set, and Quality of Potatoes.[c] 5 cents.
Cornell University Agricultural Experiment Station, Ithaca.

Oklahoma

Technical Bulletin No. T-57—Estimates of Consumptive-Use and Irrigation Water Requirements of Crops in Oklahoma.
Circular 249—Irrigation in Oklahoma.
Circular 571—Surface Irrigation Development.
Circular 632—Sprinkler Irrigation in Oklahoma.
Circular 641—Irrigation Steps to Consider.
Extension Service, Oklahoma A. and M. College, Stillwater.

Ohio

Irrigation for Fruits and Vegetables in Ohio. 5 cents.[d]
Agricultural Extension Service, Townshend Hall, Ohio State University, Columbus 10.

South Carolina

Circular 327—Supplemental Irrigation for South Carolina.
Experiment Station Bulletin 421—Sprinkler Irrigation of Corn.
Extension Service, Clemson Agricultural College, Clemson, S.C.

Tennessee

Design Handbook for Sprinkler Irrigation.
Sprinkler Irrigation Guide for Tennessee.
Agricultural Extension Service, University of Tennessee, P. O. Box 1071, Knoxville 7.

U. S. Dept. of Agriculture

Agricultural Handbook No. 82—Methods for Evaluating Irrigation Systems.[b]
Leaflet No. 342—Contour-Furrow Irrigation.[b]
Leaflet No. 343—Corrugation Irrigation.[b]
Leaflet No. 344—Furrow Irrigation.[b]
Leaflet No. 371—Land Leveling for Irrigation.[b]
Circular No. 969—Classification and Use of Irrigation Waters.[b]
Farmers' Bulletin No. 2044—Using Electricity in Watering Farm Gardens.[b]
Office of Information, United States Department of Agriculture, Washington, D.C.
Circular 969—Classification and Use of Irrigation Waters. 15 cents.[d]
Circular 2059—Irrigating Corn. 10 cents.[d]
Superintendent of Documents, Government Printing Office, Washington, D.C.

Utah

Bulletin No. 5—Measurement of Irrigation Water.[b]
FS No. 16—Easier Irrigation with Canvas and Plastic Dams.[b]
FS No. 22—Fall and Winter Irrigation.[b]
FS No. 31—Measuring Irrigation Water.[b]
Bulletin No. 166—Measurement of Irrigation Water.[b]
Extension Service, Utah State Agricultural College, Logan, Utah.

Virginia

Irrigating Vegetables and Strawberries in Virginia.
A Review of Irrigation Studies in the Southeast.
Tentative Sprinkler Irrigation Guide For Coastal Plain of Virginia.
Sprinkler Irrigation Guide for Piedmont Plateau and Mountain Valleys of Virginia.
Summary of Irrigation Conference V.P.I.
Extension Service, Virginia Polytechnic Institute, Blacksburg, Virginia.

West Virginia

West Virginia Irrigation Guide for Sprinkler Irrigation Design.[a]
Agricultural Experiment Station, West Virginia University, Morgantown.

Wisconsin

Leaflet—Figuring Costs of Irrigation.
Extension Service, University of Wisconsin, Madison 6.

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4 Reasons Why It Pays to Use Du Pont MARLATE® 50

methoxychlor insecticide

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These vegetable insects are very sensitive to "Marlate" 50 . . . are readily killed!

CUCUMBERS, MELONS, SQUASH
striped cucumber beetle
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SNAP and LIMA BEANS
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TOMATOES and COLE CROPS
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ASPARAGUS
asparagus beetles

2. High Residue Tolerance

(14 parts per million for methoxychlor) This means you can use "Marlate" 50 up to 7 days before harvest.

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The long lasting residue from "Marlate" 50 is effective protection from one spray to the next.

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"Marlate" 50 does not injure sensitive plant foliage of cucumbers, melons, squash, young tomato transplants, beans and other crops.

Use "Marlate" 50 to control insects on fruit, forage crops and livestock, too. It's ideal for controlling hornflies on cattle by the hand-dusting method. Simply apply, just as it comes in the bag, to cow's back.

MARLATE® 50
methoxychlor insecticide

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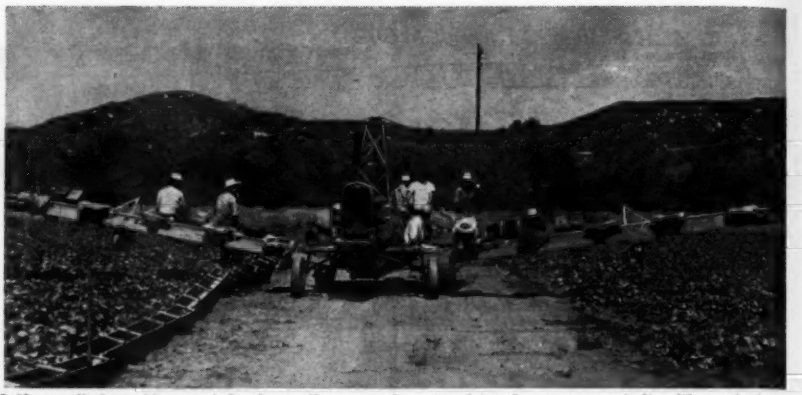


Self-propelled machine used for harvesting cucumbers consists of a conveyor belt with a platform above for pickers to lie on. "Wings" can be elevated when necessary. Machine is 44 feet long.

CUCUMBER PICKING MADE EASY

Self-propelled machine doubles number of cukes picked per hour

By BERNARR J. HALL
Farm Advisor, San Diego County

TOM IMAIZUMI, of Woods Valley near Valley Center, San Diego County, Calif., was faced with the problem of harvesting 50 acres of pickling cucumbers. Some kind of a mechanical harvester seemed to be the answer. So Tom built a self-propelled machine for 10 pickers. An improved edition was built the next year (1955) with room for 12 pickers.

Data obtained in 1954 showed increased picking output of 37% from the use of the machine. The 1955 edition was an improvement since the number of pickers was increased and only one person was needed to run the equipment and supervise the picking.

With yields per harvest of about 2 tons per acre, the machine pick of 274 pounds per hour of labor showed more than a 100% increase over the hand pick of 135 pounds per hour. The cucumbers averaged 335 fruit per hundred pounds.

In 1954, Tom's crew of 42 men harvested 50 acres of pickling cucumbers with both hand and machine picking. With the improved model last year, a crew of 24 men harvested 45 acres.

The more than 100% increase in worker output undoubtedly is due to a reduction in worker fatigue and the effect on the workers of a pace-setting piece of equipment. Another advantage favoring use of the machine is that workers do not have a chance to slack off when the supervisor is called away. Yet, pickers much prefer the machine to hand picking.

How the Machine Operates

Tom's self-propelled machine consists of a conveyor belt with a shelf or platform above for the men to lie in a prone position when picking. They lie on a 1½-inch pad of foam rubber.

Workers lying in prone position for picking cucumbers. They prefer machine to hand picking.

The picked fruit is placed on the conveyor belt. The belt moves toward the center of the machine, where the cucumbers are collected and elevated into cloth sacks for delivery to the processor.

The machine is operated by a model A Ford engine with a gear arrangement which permits the use of 20 forward speeds, varying from 3 to 35 feet per minute. The engine consumes ¾ gallon of gas per hour.

The machine is supported on four wheels located close to the engine so the equipment can be turned in a diameter of 8 to 10 feet at the end of the row. Turning time is about 1.6 to 2.0 minutes which includes a half minute for unloading the filled sacks.

The wings on either side of the machine for holding the men are supported by cables and can be elevated when turning or going over obstructions. The overall length of the machine is 44 feet. For a yield of 3000 pounds per acre, the machine moves at a speed of 12 feet per minute. Harvest is at the rate of about ¾ of an acre per hour.

Harvesting Cost

At a labor cost of 85 cents per hour the hand pick of 135 pounds per hour would cost $12.66 per ton. The machine pick of 274 pounds per hour gives a cost of $6.21. Adding machine depreciation, interest, gas and oil, repairs, and taxes of 75 cents per ton brings the machine total to $6.96.

The latter figure is based on a harvest of 825 tons per year with an average yield of 2000 pounds per harvest. At the beginning of the season the field may yield only 500 pounds per acre per pick, but later the yield may reach 2 tons per pick. With the lighter picks, it is possible to speed up the machine so the field is covered more rapidly.

Additional Advantages

Other advantages in using the machine include no tramping of the vines and cleaner picking. Some increase in yield also results, and more accurate harvest means fewer culls. Last spring the field needed weeding and thinning. Workers could do .4 to .45 acre per day by the walking method. This was doubled when the men worked from the machine.

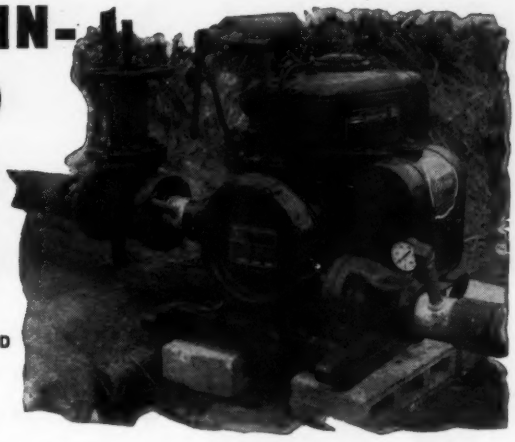
A field of soft squash also was successfully harvested with this machine. The machine operator did the grading and packing as the squash was picked. The packed boxes were piled on the rear platform and unloaded at the end of the rows.

The equipment also was used to advantage in thinning and weeding direct-seeded lettuce and cabbage crops. THE END.

keep the sprinklers going . . . with a

WISCONSIN-POWERED Pumping Unit

GORMAN-RUPP PUMPS



Gorman-Rupp Model 53M-TFD centrifugal pumping unit, powered by 2-cylinder Wisconsin Heavy-Duty Air-Cooled Engine.

Supplying a continuous flow of water for a sprinkler irrigation system is work that calls for HEAVY-DUTY ENGINE STAMINA above everything else.

All Wisconsin Heavy-Duty Air-Cooled Engines are of basic *high torque* design . . . engineered and built to "take it" hour after hour, day after day under either constant or variable load operation. These engines have the inbuilt stamina that *hangs on* and keeps the sprinklers going.

Wisconsin Engines, as supplied for irrigation service, are furnished with Stellite-faced Exhaust Valves, solid Stellite Valve Seat Inserts and positive type Valve Rotators . . . increasing valve life from 200% to 500% and reducing valve maintenance service in like measure. Automatic High Temperature Switch provides protection against preventive maintenance negligence . . . shuts off engine before damage can occur.

Basic AIR-COOLED design minimizes the number of parts concerned with cooling . . . reduces weight, which makes for most convenient portability . . . operating from ponds, ditches, streams, lakes or field wells.

All models (3 to 36 hp.) can be supplied with electric starter and generator or starter only, if specified when engine is built. For further information write for folders S-181 and S-188 . . . and specify "WISCONSIN" for your pumping unit.

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World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

COMPLETE SPRINKLER LINE AS LOW AS 25¢ PER FOOT
With Couplings & Clamps

GET THE RAIN WHEN YOU NEED IT
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"BEST BY FARMER TEST"

Write or Phone For Further Information

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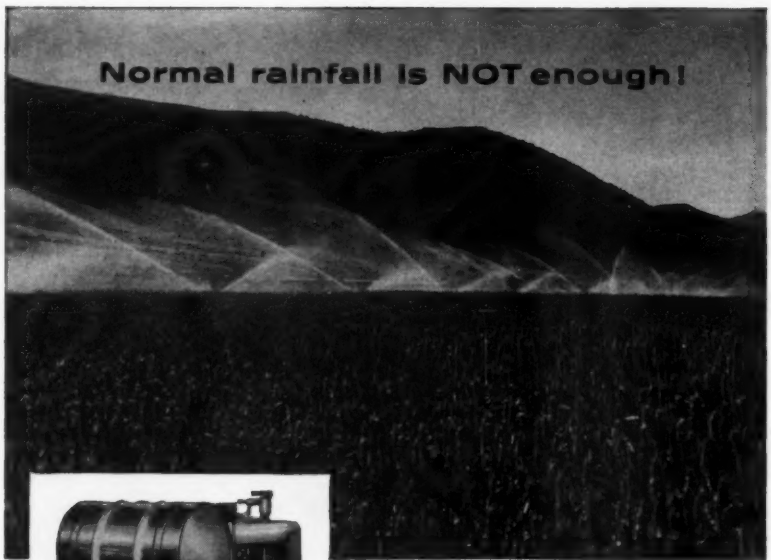

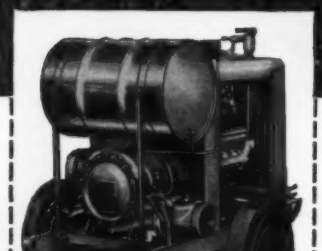

26 MODELS in centrifugal pumps for every irrigation requirement. Pump-and-engine packaged units with automatic check valve with level control, shaft seal under suction, large drum-type fuel tank—operational safety controls standard. Engines: air-cooled, radiator, or heat exchanger. Gasoline, LP, natural gas, kerosene and diesel. Also PTO driven pumps.

IRRIGATE and PROSPER
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The big question about rainfall is not whether the year's total is normal, but whether enough falls at the right time. This rarely happens.

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Be practical about irrigation. Get an engineered plan. No obligation. Write Gorman-Rupp today.

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  Second edition discusses individual vegetables, time and depth of planting, harvesting, and marketing.
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AMERICAN VEGETABLE GROWER **Willoughby, Ohio**

CALENDAR OF COMING MEETINGS AND EXHIBITS

June 14-16—Idaho Shippers Association (including Malheur County, Ore.) annual summer convention, Sun Valley.—Edd Moore, Exec. Sec'y, P. O. Box 1106, Idaho Falls.

June 27-29—South Dakota State Horticultural Society annual meeting, in conjunction with South Dakota Federation of Garden Clubs, Brookings.—W. A. Simmons, Sec'y, Sioux Falls.

July 17—Indiana Vegetable Growers Association summer field day, Ed Rislow's farm, 7 N. Roend, Indianapolis.—F. C. Gaylord, Sec'y, Purdue, University, Lafayette.

July 28-August 4—Eighth annual National Vegetable Week sponsored by the VGAA.

Aug. 1-Sept. 12—Vegetable Growers Association of America, second Grand Tour of Europe visiting England, Norway, Sweden, Denmark, Holland, Germany, Switzerland, and France. Tour conducted by Walter F. Pretzer, % American Express Company, 1425 Euclid Ave., Cleveland 15, Ohio.

Aug. 9—Twenty-fifth annual Darke County (Ohio) Potato Field Day, Virgil Royer farm, Arcanum.—E. C. Wittmeyer, Sec'y, Columbus.

Aug. 11—Illinois State Vegetable Growers Field Day, University of Illinois, Urbana.—N. F. Oebker, 308 Vegetable Crops Bldg., U. of Illinois, Urbana.

Aug. 14-15—Ohio Pesticide Institute annual meeting, Ohio Agricultural Experiment Station, Wooster.—J. D. Wilson, Sec'y, Wooster.

Sept. 23-26—Produce Packaging Association Conference & Exposition, Hotel Fontainebleau, Miami Beach, Fla.—Association headquarters: 500 Fifth Ave., New York 36.

Sept. 27-29—Florida Fresh Fruit and Vegetable Association annual meeting, Hotel Fontainebleau, Miami Beach.—Geo. Talbott, 4401 E. Colonial Dr., Orlando.

Oct. 8-10—Texas Citrus & Vegetable Growers & Shippers, Plaza Hotel, San Antonio.—Headquarters: Austin Anson, 306 East Jackson, Harlingen.

Oct. 31-Nov. 1—Wisconsin State Potato Show sponsored by Wisconsin Potato Growers Association, Inc., Antigo. Annual meeting of association Nov. 1.—Harold R. Simons, Sec'y, Box 22, Antigo.

Nov. 1-2—Western Growers Association 31st annual convention, Sheraton-Palace Hotel, San Francisco, Calif.—Headquarters 606 S. Hill St., Los Angeles 14.

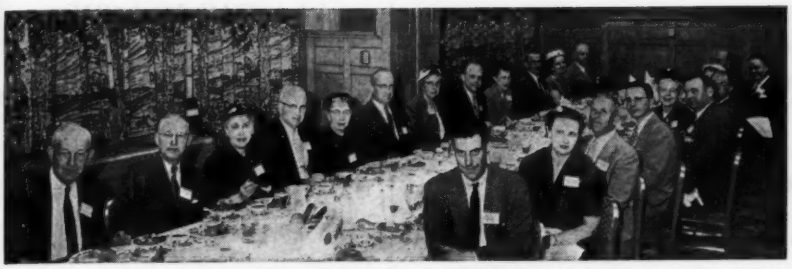
Nov. 28-30—Vegetable Growers Association of America, 48th annual convention, Grand Rapids, Mich.—Joseph S. Shelly, Sec'y, 485 Mills Bldg., 17th and Pennsylvania Ave. N.W., Washington 6, D.C.

Jan. 28-31, 1957—United Fresh Fruit & Vegetable Association, Benjamin Franklin Hotel, Philadelphia, Pa.—Association headquarters: 777 14th St. N.W., Washington, D.C.

Feb. 4-6—Ohio Vegetable and Potato Growers Association 42nd annual meeting, Netherland-Plaza Hotel, Cincinnati.—E. C. Wittmeyer, Sec'y, Columbus.

SHORT OF WATER? TRY HAY MULCH

E. Stuart Hubbard, Poughkeepsie, N.Y., mulched his 3 acres of tomatoes, Comet variety, with 7½ tons of old hay just after planting. Vines were trained to strings on wire trellis. In July Hubbard set up a small watering system delivering 30 gpm. The mulch kept the ground moist for twice as long as where no mulch was used. Result: Lots of early tomatoes. Nutrients leached out of the hay mulch helped too.



FOOD EDITORS GIVEN FACTS ON GREENHOUSE CROPS

Members of the Cleveland Greenhouse Vegetable Growers Association entertained radio, TV, and newspaper food editors at a luncheon in April to celebrate the start of the marketing season for the spring crop of tomatoes. The luncheon was only one in a series of promotions sponsored by the Cleveland greenhouse group which feels that actions speak louder than words in promoting vegetables. Each editor was given a basket of tomatoes and a basket of cucumbers, leaf and Bibb lettuce to take home. The main dish on the menu was a tasty salad prepared to each editor's specifications from fresh, greenhouse-grown produce. Editors were told how to identify greenhouse-grown tomatoes by "looking for the green calyx," and were urged to call upon the association for any information.

STATE NEWS

(*Continued from page* 15)

of the Cleveland Greenhouse Vegetable Growers' Association at their annual meeting held at Columbia Station.

Ellis D. Hoag, who operates the J. Hoag & Son Greenhouse, Elyria, was elected vice-president, and Charles W. Sanderson of Columbia Greenhouse, Columbia Station, secretary-treasurer.

Activities for the year, including legislation, research and sales promotion, were discussed by the 80 members present at the meeting.

Onion Set Yields

ILLINOIS—In a fertilizer trial last summer on the farm of Harry Paarlberg, onion set grower, 40 pounds of nitrogen per acre increased the yield of sets about 16%. Heavier rates of the nitrogen produced bigger, greener plants, but yield was no bigger.

OPPOSE ONION FUTURES TRADING

Two members of the Vegetable Growers Association of America, Jim Swan, past president of the association, and Isaac De Hollander, president of the Oswego County (N.Y.) Vegetable Growers, opposed onion futures trading before recent House Agriculture Subcommittee hearings in Chicago.

Swan said that insult was added to injury when March onions were sold on the Chicago market at 10 cents a 50-pound bag in a sack costing the grower 19 or 20 cents and freight charges of 15 to 20 cents.

Both Swan and De Hollander were unanimous in saying that onion growers have a right to expect onion prices based on supply and demand at the market place. The small amounts of onions traded on future contracts in comparison to other commodities traded on futures and their perishability have created a situation in which unscrupulous speculators outside the onion industry can create vicious and abnormal supply and demand situations.

Swan indicated in his testimony that onions differ from other commodities in that they go directly to retail channels and are not subjected to necessary processing in the marketing chain.

New Irrigation Recommendations

CALIFORNIA—A revised theory of sprinkler setting for best irrigation results was outlined to growers and equipment dealers at a recent sprinkler irrigation clinic at the University of California's College of Agriculture at Davis.

Previously recommended spacings of 40 feet for sprinkler heads and 60-foot movements of pipelines were revised in recommendatitons to 30-foot spacing and 50-foot movements of line. Also recommended was higher nozzle pressure—45 to 50 pounds instead of 30 to 35 pounds previously recommended.

There were two main reasons cited: 1) During windy periods there is a better distribution of water. 2) Higher pressure means smaller droplets. It was found at low pressures there was a tendency of the droplets to coalesce and beat unplanted ground, causing a deep crust that made penetration difficult for the germinating plants.

It was recommended that owners of present sprinkler systems can profit from a review of their present system. This should include pump tests made by power company representatives and actual measurements taken in the field, using surface cans and soil augers. Slight changes in nozzle size, angle and location may be of great benefit, according to the findings of research engineers.

The Tomato Growers Association of California, the largest single commodity group in the state, has decided to study the possibility of incorporating the group separately from the California Farm Bureau.

Members declared at their annual meeting held in Stockton that they have no quarrel with the California Farm Bureau, but believe that incorporation would provide better operational procedure. William Crinklaw, of King City, was installed as 1956 president.

Effects of the northern California floods will probably be felt in the vegetable markets this spring and summer because wet fields prevented growers from planting spring and summer crop acreages.

Ordinarily in California, December and January are active months for preparing the ground and planting spring and summer crops. Apart from some plantings in late November and early December there was little field work in the northern San Joaquin Valley and central coast districts this year. —*Neale Leslie.*

Varieties for Freezing

MINNESOTA—Choice of varieties that do not freeze well is often responsible for inferior quality in the frozen product.

Among varieties recommended by the University of Minnesota department of horticulture as suitable for freezing are these: *Asparagus*—Washington, Faribo F_1. *Green Beans* (bush)—Topcrop, Tendergreen, Wade; (pole)—Kentucky Wonder. *Yellow bush beans*—Cherokee, Pencil-Pod Black Wax, Brittle Wax. *Lima beans*—Triumph, Burpee's Improved (for southern half of Minnesota only). *Broccoli*—Waltham 29. *Brussels sprouts*—Long Island Improved. *Cauliflower*—Snowball, Super Snowball. *Sweet corn* (on cob)—Sugar and Gold, Golden Freezer, Golden Cross Bantam. (Whole kernel)—most good garden varieties. *Peas*—Little Marvel, Laxtons Progress, Burpeana Early Dwarf, Lincoln, Dark Seeded Perfection. *Spinach*—Bloomsdale Long Standing, America, New Zealand.

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Make Old Soil Like NEW

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EFFECTIVE • EASY • ECONOMICAL
SOIL FUMIGANT

Read what Dr. A. W. Dimock, Plant Pathologist at Cornell University, wrote in the N.N.Y. State Flower Growers' Bulletin #107, July 1954:

"With reasonably tight bottoms and sides of the benches, and with covers of pure plastic or plastic impregnated sheeting, it should be possible to attain as good sterilization and weed control with chlorpicrin as with steam."

INCREASE YIELDS—CONTROL MOST SOIL-BORNE DISEASES, "DAMPING-OFF, WILTS, ROOT ROTS," NEMATODES AND MANY WEED SEEDS WITH SINGLE APPLICATION

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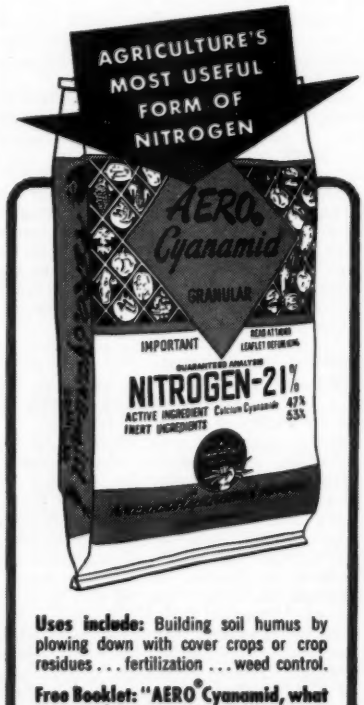


Uses include: Building soil humus by plowing down with cover crops or crop residues . . . fertilization . . . weed control.

Free Booklet: "AERO® Cyanamid, what it is and how to use it." Write to American Cyanamid Company, 30 Rockefeller Plaza, New York 20, N. Y., or see your dealer.

PLASTIC MULCHES

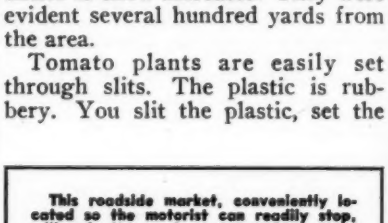
(*Continued from page* 11)

tic with a corn jobber along each side of the furrow in early April. The jobber planted as easily through the plastic as it did in bare ground. The plastic springs back to a narrow slit at each job.

The beans came up a week ahead of those in the check plot, which was badly crusted by rain with only a medium stand. The measured soil temperatures were 10 degrees higher under the plastic. The beans on the plastic outgrew the check and were dark green as compared to the yellowish color of the check beans. Of course, the check beans greened up later, but nitrification under the plastic was greatly stimulated as shown by early dark green color. The farm help said that for once we had a test that didn't need statistics to show increases. They were evident several hundred yards from the area.

Tomato plants are easily set through slits. The plastic is rubbery. You slit the plastic, set the plant, and the plastic springs back around the plant, keeping out weeds.

This roadside market, conveniently located so the motorist can readily stop, will make it easy for you to take care of customers quickly. Movable racks make it possible to maintain an attractive stand

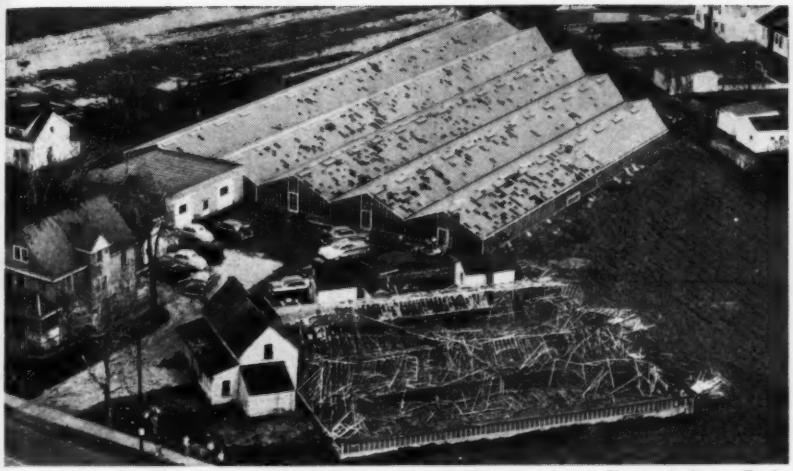


In accordance with supply and demand, and the overhanging roof affords protection for the customer. Working drawings for this easy-to-build stand are available for $1.50 from AMERICAN VEGETABLE GROWER, Willoughby, Ohio.

Cost of Plastic Mulch

While the plastic is easily laid, it would be slow to hand-lay large acreages. However, a machine can be made which will put in fertilizer, lay the plastic, and job in seeds or set plants through the plastic as it moves along. If such a machine is made, and due to the cheapness of the plastic itself, the procedure would be much more economical and profitable than any other mulch ever used. If half the ground is covered, the plastic will cost only $25 per acre a year, assuming it lasts four

(*Continued on page* 34)



Helicopter view by Dudley Brumback, Cleveland Plain Dealer

NATURE'S WRECKING CREW

A 70-mile-per-hour storm on May 12 in the Cleveland, Ohio, greenhouse area demolished the Steinbreck greenhouses in the foreground and flying glass damaged those in the background. Lettuce planted between rows of tomatoes had just been harvested, but the tomato crop, ready for harvest, was destroyed. Estimated damage: $40,000.

PLANNING TO IRRIGATE?

(*Continued from page* 13)

to irrigate from it and the frequency of application. Streams and natural lakes, where available, are excellent sources of water. Stephen Blodgett pumps from the Fishkill River and its tributaries where they pass through or near his land. Often the tributaries do not supply enough water for his requirements, however.

What kind of equipment?—An irrigation engineer can lay out your equipment requirements very efficiently. With his knowledge of water, soils, and crops, he is the first man to talk with after you have considered the above three questions.

Irrigation equipment is costly, so it must do the job right. In round figures, costs range from $60 to $125 per acre. This is in addition to any cost for drilling a well or building a pond. It covers pump, pipe, fittings, and sprinklers for 50 or more acres. Small acreages usually cost more per acre.

For his equipment to water 300 acres John Martin invested $35,000. It costs him between $7 and $8 to apply an inch of water to an acre of beans and between $10 and $11 per acre to put 1½ inches on tomatoes. This covers labor, power, and interest on overhead. His equipment includes one 1000 gpm pump, one 1400 gpm pump, 1¼ miles of 6-inch aluminum mains, 4 miles of 4-inch laterals, 100 sprinklers that deliver 20 gpm, and other smaller items.

Stephen Blodgett, in the Hudson Valley on a different soil type, uses large sprinklers, each watering about 2 acres at a time. He operates two of these sprinklers on each of his eight 1000 gpm pumps. Large sprinklers take less labor to move from place to place than do several smaller ones, and are sometimes a less expensive investment per acre. But you must be sure your soil will take the impact of the larger drops and force of water.

The Pay-off—The pay-off with irrigation is the increased yields of crops and money returns per acre. T. Noble Jarrell, of Goldsboro, Md., three years ago irrigated snap beans three times with an inch of water each time. Yield of beans was 3 tons per acre, while unirrigated fields hardly made a ton per acre. Each application cost about $7 per acre, so irrigation was more than paying its way.

Jarrell also put one water application on tomatoes and boosted yields by 3 tons per acre. When you can grow 3 tons of tomatoes for $7, then irrigation is really profitable.

THE END.

PACKAGING EXPERIENCES

Is there a better package which will bring you higher prices? The answer, in many cases, is a definite yes. A Michigan cantaloupe grower shifted from an open bushel to a carton flat and netted $150 more per acre. A 12-quart slicer cucumber carton gave higher returns to another grower.

These and other packaging improvements will be discussed in our coming August Packaging Issue. So that we can include as much information as possible about new packages, we would like to hear about your favorite package and the savings or higher prices you have achieved with it. Send a letter about your packaging ideas to R. T. Meister, Editor, AMERICAN VEGETABLE GROWER, Willoughby, Ohio. Fifteen dollars will be paid for each contribution published.

NEW —for portable irrigation...

McDowell Medium Pressure Couplings

See your reliable McDowell dealer—he's a good man to know better!

Now—your McDowell dealer offers a new line of McDowell couplings, especially designed for economical operation at medium pressures. This new design, when used for working pressures of 50 p.s.i. to 100 p.s.i., provides all the superior advantages formerly found only in McDowell High Pressure Couplings. Further, they're low in cost, thus making possible considerable savings in your initial investment.

Note streamlined design. No hooks, latches, or gadgets.

Remember, too—for pressures over 100 p.s.i., nothing equals the efficiency and performance of McDowell H.P. Couplings!

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Junior Growers Urged to Enroll at Once in P&M Contest

Some production projects call for preplanting work

NOW is the time to make definite plans to enroll projects in fruits and vegetables in NJVGA's Production and Marketing Contest. This contest has, for the current year, a number of sections and sub-sections. It includes the choice of fruits and/or vegetables, grown for either fresh use or for canning or processing.

In addition, there are sub-sections for junior growers interested in the effect of soil fumigation and the testing of varieties of several different kinds of vegetables. Each of these sections and sub-sections has excellent awards on a national, regional, and state basis.

We wish to draw particular attention at this time to the soil fumigation and variety trials sub-sections because individuals who wish to participate must carry out the initial work prior to planting time.

Stanley Pieczarka, Jr. (center), Agawam, Mass., national winner of NJVGA Production and Marketing Contest last December, received a ton of Ammo-Phos high analysis fertilizer for his achievement. He is being congratulated by Dr. Joseph D. Campbell, agronomist with Olin Mathieson Chemical Corporation, and Dr. Grant B. Snyder, NJVGA adult adviser. Olin Mathieson provided the award. Stanley will enter Purdue University this fall to work for his doctor's degree in horticulture, paying a part of his way with the profits from his corn and tomato crops.

Soil Fumigation Project

The use of soil fumigants to control nematodes, wireworms, and other similar soil pests is standard practice in many states. Our project is simply a means of having members become acquainted with the materials used, the method of use, and what results can be expected in the way of control and the effect on crops grown in soil that is treated.

The project can be of any size, from a few hundred square feet upwards. It offers an excellent opportunity for the older members to carry out a project involving specialized treatment. The Dow Chemical Company has provided funds to the NJVGA Foundation for awards in this subsection of the P & M Contest.

Variety Trials

Varieties can make the difference between a successful or unsuccessful garden project. Selecting the variety best suited to your soil and climate as well as for the particular market or use for the product is a basic part of your garden plan. Your state leader can supply a list of recommended varieties. It is always wise, however, to check other varieties on an experimental basis to determine whether some of them may be better suited to your conditions.

The procedure for obtaining seed is simple. Just fill in the kind of vegetables you wish to grow—sweet corn, lettuce, cucumbers—on page 4 of the Standard Report Form, tear out, and mail to the W. Atlee Burpee Seed Co. They will then send you two or three varieties of each kind of vegetable you listed.

Do not delay in planning to participate in either one of these subsections. Remember—you have a number of choices in the P &M Contest. Check with your local or state leader or write to NJVGA headquarters.

Convention Plans

NJVGA members attending the annual convention in Atlanta, Ga., December 9-13, 1956, will really experience true southern hospitality along with a program of four days chuck full of interesting activities.

While the final agenda for the tours is not yet ready, one day will be spent in and around Atlanta visiting such large industries as Lockheed Aircraft and the Ford Motor Co., the market

A bi-monthly page for the younger generation of vegetable growers and their national organization, the National Junior Vegetable Growers Association. For information write Grant B. Snyder, French Hall, University of Massachusetts, Amherst, Mass.

area including the wholesale district and the warehouse and prepackaging facilities of one of the large grocery chains, plus a number of the historical spots for which Atlanta is famous.

The second day will feature the story of cotton, from harvest (by hand and by machine) to ginning and processing and finally the manufacture of the finished cloth. In addition, plans are underway to include visits to a large processing plant, the experiment station, Stone Mountain, and the many other points of interest in the vicinity of Griffin, Ga.

The convention will, of course, again feature the National Demonstration and Judging Contests, plus a full supply of entertainment and square dancing in the evenings. The annual awards banquet on December 13 will feature special souvenirs, entertainment, and an outstanding speaker.

Make Reservations Early

The Atlanta Biltmore Hotel, headquarters for the convention, is one of the outstanding hotels in the city and has excellent facilities for the many activities planned. Room rates will be $4 per person per day in rooms with double bed plus one comfortable cot; $5 per person per day in rooms with twin beds, plus 3% state tax. Reservations should be made as early as possible specifying a) attendance at the NJVGA convention, b) date of arrival and date of departure.

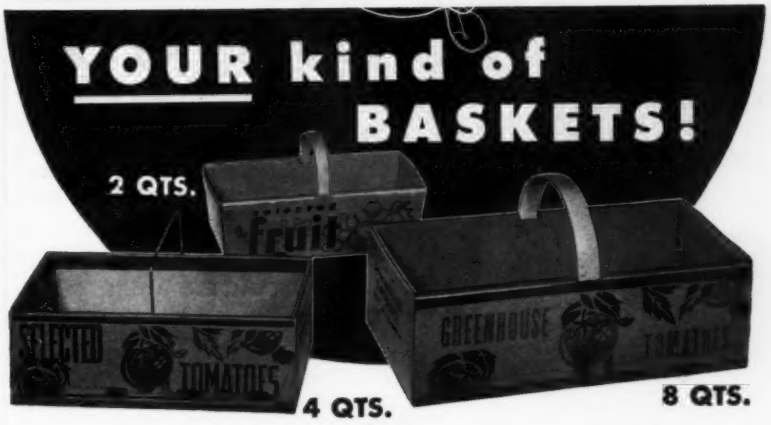
ASPARAGUS GROWING COSTS

THE old saying, "It takes money to make money," got an apparent boost from a recent study of asparagus growing costs and returns.

Dr. J. W. Carncross, agricultural economist at Rutgers University, made a survey of 84 New Jersey farms, representing 2,773 acres of asparagus grown for processing. The following table summarizes the relation found between costs, returns, and yields:

RELATION OF YIELD OF ASPARAGUS FOR PROCESSING TO COSTS AND RETURNS IN NEW JERSEY

	10 lowest yielding farms	10 highest yielding farms
Total cost up to harvest (per acre)	$117.13	$124.66
Total cost harvesting per pound	.04	.03
Total of all costs per acre	172.86	226.97
Total cost per pound	.14	.08
Receipts per acre	149.17	358.75
Returns above cost per acre	23.69	131.78
Yields per acre (lbs. cut asparagus)	1,248 lbs.	2,986 lbs.
Fertilizer per acre	1,500 lbs.	2,200 lbs.
Average farm size	19 acres	40 acres



Successful growers by thousands have shown that our baskets, boxes, and containers for retail and bulk marketing promote better profit for the vegetable producer.

Product of our complete PLANNED PACKAGING facilities, these marketing specialties are made of fine quality corrugated board, attractively printed in 2 colors. Sizes—2, 4, 8, 12, and 16 quarts. Wood or wire handles. Shipped flat for easy storage. Easy to set up. Write PRODUCE SALES, The Ohio Boxboard Co., Rittman, Ohio.

5 SIZES— *wood or wire handles*

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1956 completely revised chart

That is the important question in economical spraying. The compatible nature of spray materials is mighty important in safe and effective spraying and AMERICAN VEGETABLE GROWER has produced an ingenious

SPRAY COMPATIBILITY CHART

which tells at a glance just what materials will mix safely. Printed in three colors, mounted on Bristol board paper, it is an accurate guide in the safe and successful mixing of all spray chemicals.

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IRECO Mobile Speed-Roll and Speed-Tow Units Also Available.

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Long White Shank Bunching Onion

Long White Shank Bunching Onion is becoming more popular for quality minded growers all the way from Los Angeles to New York. The tops are dark green, long, and vigorous; the shank is long and very mild and will not bulb easily.

Recommended Varieties for Southern Commercial Growers

EARLY CRYSTAL 281 FLAT WHITE
GRANEX YELLOW F_1 HYBRID
GRANEX WHITE F_1 HYBRID
YELLOW BERMUDA EXCEL 986 FLAT

Recommended Varieties for Northern Commercial Growers

ENCORE	F_1 HYBRID
EPOCH	F_1 HYBRID
ELITE	F_1 HYBRID
FIESTA	F_1 HYBRID
ABUNDANCE	F_1 HYBRID
IMPERIAL 49 SPANISH YELLOW	

DESSERT SEED CO., INC.

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Celery grower Cornelius Buddingh holding one-half of his patented weeding machine.

WHIRLIGIG WEEDER

Michigan celery grower's weeder does quick, easy job

A MICHIGAN celery grower's whirligig makes weeding a row crop "easy as pie!"

The patented laborsaving mechanical weeder was designed and built by Cornelius "Case" Buddingh for use on the 50-acre celery farm which he and his brother, Marinus, own and operate at Caledonia, Mich. It worked so well on the home farm that Buddingh went into large-scale manufacturing and established dealerships from Michigan to Florida.

The Buddinghs grow their celery on muck soil, and with either brother at the wheel of a model HG Allis-Chalmers tractor equipped with a 2-row combinatiton, an acre of celery gets a complete weeding in about 45 minutes. In fact, the faster they go, the better the weeder seems to work.

Front view of weeder, taking two rows at a time.

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Add to your income by selling AMERICAN VEGETABLE GROWER. Write today for our liberal, nursery agents' plan. Address:
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SPRINKLERS

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FREE LITERATURE *gives the facts about sprinkler irrigation—how it's used, advantages, results, how to select sprinklers, how to have a system planned. Write for it TODAY.*
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SEEDS
To start your crops
BEST SPRAYS
To protect them
Write today for list
• INSECTICIDES
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• WEED KILLERS
Letherman's
Dept. VG
Canton 2, Ohio

The weeder consists of rotating cones fitted with flexible coil spring "fingers" which literally reach into the row between the plants and stir and churn the surface soil, rooting out the seedling weeds before they can become established. The coil springs are especially tempered to be stiff enough to work the soil, yet flexible enough to avoid injuring tender crop plants. It can be safely used 10 days after plants are set.

At this stage weeds are less than one-half inch high and are easily destroyed. Three or four quick trips over the field at four- or five-day intervals put the Buddingh celery crop so far along that the plants shaded the rows enough to keep weeds from presenting a problem the rest of the way to harvest.

Cuts Weeding Costs

In Michigan's Hudsonville celery area, growers John Bosgraaf and Jack Sawyer use the Buddingh weeder on both riding and walking tractors.

Plans for a modern, low-cost potato storage are now available to AMERICAN VEGETABLE GROWER readers. The aboveground 50-foot square storage is designed to hold 17,500 bushels. A list of materials is included with the plans. Send remittance of $1.50 in form of check or money order to AMERICAN VEGETABLE GROWER, Willoughby, Ohio.

"Hand weeding costs are only about a fourth what they were before I got the weeder," says Bosgraaf.

Florida farmers, meanwhile, are field-testing the invention in celery and other row crops. After using the Buddingh weeder for eight weeks in celery, Roy Vandergrift, of Pahokee, reported savings of better than 75% in hand hoeing costs."

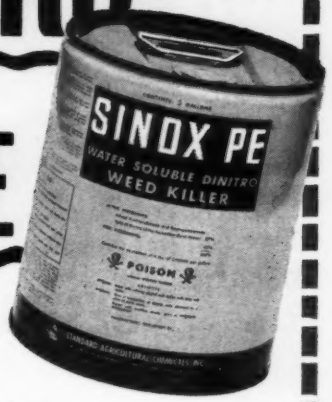
Vandergrift said that a tractor outfitted with the weeders for 2-row operation and run at 5 m.p.h. could cultivate 20 acres a day with no damage to the celery. He plans to use the weeder on beans, corn, and cabbage.

Weeds Other Crops

Elsewhere the weeder has successfully worked peppers, sweet corn, escarole, onions (whether from seed or sets), bedded tomatoes and potatoes, and new strawberry beds. Buddingh says he has yet to find a sandy or loam-type soil in which the weeder would not work properly. However, in heavy ground results are not so good.

The 13-inch faces of the cones limit the weeder to crops grown in rows at least 16 inches apart. Buddingh is now working on a design for cones with 9-inch faces, for use on closer-spaced crops such as spinach.—*Charles E. Johnson.*

STANDARD-ize on SINOX PE



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chemical weed control
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SINOX PE eliminates the weeds that are robbing your crops of valuable nutrients, without harming the crops themselves . . . does the work of a whole gang of field men at a fraction of the cost! This profitable spray can be applied at *any time* between planting and emergence...whenever it is most convenient for you.

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P. O. Box 535
EDWARDSVILLE, ILLINOIS

COVERS 80 FT. IN ONE PASS!

Nothing Else Does it Like . . .

BES-BLO RC for Row Crops

Adjustable deflectors fit spray pattern to crop and weather conditions.

3 Sizes . . . one to suit your needs.

Quickly attached to your present sprayer.

200 LB. DUST HOPPER (optional)

"DRIVING AIR" assures Faster, More Thorough Pest Control . . . at Lower Cost

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VEGETABLE PRODUCTION AND MARKETING

By Paul Work and John Carew

General chapters in the new second edition of this practical book cover culture, harvesting, storage and marketing. Individual chapters cover the major crops of potatoes, tomatoes, sweet corn, root crops, peas and beans, vine crops, onions, cabbage and related crops, celery, lettuce, spinach, asparagus and rhubarb.

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Directional Heat Flow
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Is Being Used With Outstanding Results

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BLUE GRASS BUTANE CO., Inc.
2417 Nicholasville Pike Lexington, Ky.

PLASTIC MULCHES

(*Continued from page 28*)

years. It is as good as ever at the end of the second year.

Some growers may wonder about removal at the end of the crop. It is unlike other materials in this respect, since it is still practically as strong as when new. A machine could easily rewind it from the ground since it can be pulled up readily and rewound by hand for use the following year. The jobbed holes can be reused. Of course, laying in two sheets along each side of a single row can also be done and makes relaying somewhat easier.

If the plastic is on a furrow with a good downgrade, even with holes punched in it, the shoulders of the furrow stay loose. In a small way trials have been made just leaving the plastic lay and jobbing back through the holes. This worked fine on a grade, but if the ground is nearly level, the water backs up under the plastic and the ground packs. The bean yields on the grade where the soil was loose were as good as on fresh-plowed soil with plastic on it.

Control of Weeds

Weeds were well-controlled and only occasionally did some of the larger weeds from roots or large seeds get through the slits. Small-seeded weeds didn't have a chance. Of course, techniques will have to be worked out for small-seeded vegetables, but it seems this can also be worked out. The system works especially well on vine crops. Besides forcing the vine growth, melons and pickles were not spotted. The plastic can be walked on to harvesttime without damaging it.

Comparative tests on complete and partial coverage showed that somewhat better results were obtained the more the ground was covered. It seems that 4-foot widths may be better than 3-foot widths. Complete coverage is difficult to do. Weeds are easily controlled in the strips between the plastic, so it seems best to leave part uncovered.

If the plastic is laid on each side of level planted rows, perforations should be made on each side in the depressions to allow water to go through if wide strips are used. Most of our work has been done on furrows. In this case small "T" slits are made in the bottom of the furrow, with the stem of the "T" toward the flow of the water. In rains, the water runs through these slits under the plastic and off the outer edges, much going under the plastic here also. All moisture under the plastic

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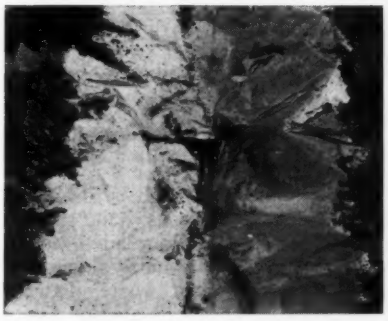
stays at least 10 days longer than in bare soil.

Furrow Irrigation

In dry weather, gated pipe or perforated plastic tubing is used to run water down the furrow. This system of irrigation uses about one-third as much water as overhead sprinkling and stays at least 10 days longer. With contoured furrows it can be used on most types of rolling land. It carries water and distributes well on porous soils that otherwise could not be used for furrow irrigation. The "T" slits are made 1 to 1½ feet apart on steep slopes and 3 to 3½ feet apart on more level ground.



"T" slit made for furrow irrigation to allow water to run onto the soil. Small "T" slits are made in the bottom of the furrow, with the stem of the "T" toward the flow of water.

Foliage is not made wet and less disease is nearly always found when furrow irrigation is used. One year bacterial blight hit Kentucky Wonder beans on rotary sprinkled plots and they were practically all unsalable, while all beans from the furrows were salable. Tomato fruits were not spotted or cracked so much and a much higher percentage was salable. Ground spattering is stopped. This is a serious way for disease to spread on bare soil. Sun heat is absorbed with less sunburning of fruits.

There are some disadvantages. Seeds planted through plastic in midsummer sometimes get too hot. A planting in August gave poor stand due to cooking of seed in 100° F. air temperatures, the soil being over 120° F. For this reason aluminum pigmented polyethylene looks good for hot weather, since it reflects light and keeps soil cool under sun heat. Yields in the summer were better with aluminum pigmented plastic than with black plastic, but this was not so in early spring. Thin aluminum foil (.00035) laminated to 1½ mil polyethylene film also gave good yields and handles well. It is tough. However, it is more costly than black plastic. THE END.

Black plastic can be obtained from Peter & Co., 3618 Lexington Ave., Louisville 7, Ky.

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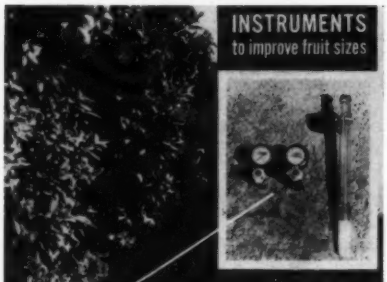
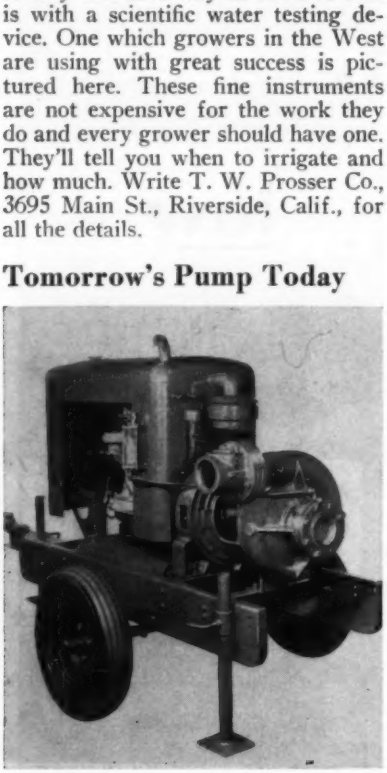
Know When to Water



It's useless to pour water on your vegetables if they don't need it. There is only one sure way to tell and that is with a scientific water testing device. One which growers in the West are using with great success is pictured here. These fine instruments are not expensive for the work they do and every grower should have one. They'll tell you when to irrigate and how much. Write T. W. Prosser Co., 3695 Main St., Riverside, Calif., for all the details.

Tomorrow's Pump Today



A demonstration of a new heavy-duty irrigation pump incorporating many new and revolutionary features is now available. The new pump is powered by a Ford 223 cubic inch engine of which high compression gives low fuel consumption. The pump is fully equipped with positive safety controls and a new priming mechanism allows the grower to prime the pump while it is warming up. A new connection between the pump and engine makes disassembly and reassembly quick and easy. Why not be fully advised? The Marlow Pump Co. will be glad to send you a descriptive catalog. Just write to Marlow Pumps, P. O. Box 566, Ridgewood, N. J.

Automation

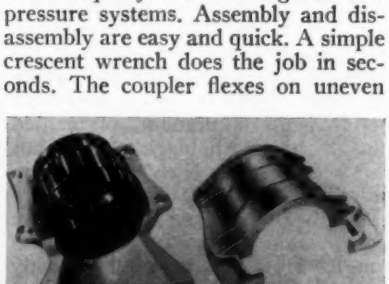
Many growers in different vegetable growing areas all over the country have told me of the exceptional job a new leaf harvester is doing. The unit harvests one row at a time, is particularly adapted to difficult areas where larger 3- or 4-row machines cannot operate. It is ideal for spinach, mustard greens, kale, turnip greens, parsley, and salad greens. You'll want to know more about the new harvester; just write Tawco Products Co., 1224 Chesapeake Ave., Columbus, Ohio.

WE WERE WRONG!

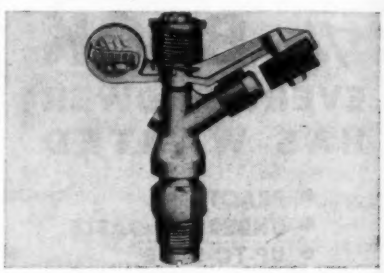
In the May issue we pointed out that the Cornell booklet entitled, "New Descriptive Catalog of Vegetables #14," would be sent free to you, our readers. Actually the booklet costs $1. Even at that price, it is well worth it and should be part of your library. Although it does not cover, as we indicated, all phases of vegetable growing, it does present a comprehensive study of seed varieties.

Die-Cast Coupler

A wonderful new demountable aluminum coupler for irrigation pipe is now available to vegetable growers at no increase in cost. The new die-cast coupler provides the same twist-lock feature of the ever-popular Mathieson coupler which has been sold since 1948. The new coupler has a one-piece rubber gasket which works equally well for high or low pressure systems. Assembly and disassembly are easy and quick. A simple crescent wrench does the job in seconds. The coupler flexes on uneven ground and is being made in sizes from 2 to 8 inches. Why not have the full details on this superior coupler at no extra cost? Just write Jim Fox, Olin Mathieson Chemical Corp., Medical Arts Bldg., Little Rock, Ark.

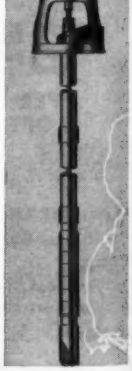


For Heavy Use



Two new sprinkler heads which insure the grower of trouble-free service have been developed and field-tested. The new sprinklers incorporate neoprene to absorb impact at the point where the oscillating arm contacts the sprinkler frame. A new type of bearing located in the bottom of the sprinkler body is well-protected from abrasive material. Speed of rotation is easily regulated with both sprinklers. A special grit guard bearing is available if needed. Why not get full details on these two new sprinkler heads today. Just write Skinner Irrigation Co., 1006 Water St., Troy, Ohio.

Electric Pump



If you have available electric current at your pump site, the newly designed pump pictured here can do a remarkable job for you. The new pump delivers more water per horsepower and is built to last. Of course, it is made in a wide selection of sizes so you can be sure there is a unit ideal for your irrigation job. The new pumps are ruggedly built, powered by G.E. motors and will fit 4- or 6-inch wells. Why not write Layne and Bowler Pump Co., 2943 Vail Ave., Los Angeles 22, Calif., for particulars.

BOOK REVIEW

WATER. The Yearbook of Agriculture, 1955. This latest USDA yearbook covers the important elemental subject of water.

Secretary of Agriculture Ezra Taft Benson says in his foreword to the book: "Water has become one of our major national concerns. Farmers have had to haul water for stock in trucks from cities. Some cities have had to haul water from farm ponds. New Yorkers for a time had to cut down the number of their baths. Homeowners in many places had to give up watering their lawns. Some city councils have had warnings that the growth of their cities would be limited by the availability of water."

Farm people, to whom this book is especially addressed, are well aware of the need for water. This book tells them how to make the best use of the water they have. It tells where water comes from and what happens to it; how much can be used and when, and how our land practices influence its behavior.

Each chapter is written by an expert in his field—and the 100 pages devoted to water for irrigation contain practical information for every vegetable grower.

Obtain a copy free by writing to your Congressman, or send $2 to the Superintendent of Documents, Washington 25, D.C.

Insect Pests of Farm, Garden, and Orchard, Fifth Edition. $8.50. John Wiley & Sons, Inc.

This thoroughly revised edition is the work of the late Dr. Leonard M. Peairs, professor and chairman emeritus of the department of entomology at West Virginia University, and Dr. Ralph H. Davidson, associate professor of entomology at Ohio State University, who joins its authorship for the first time in the 44 years that this practical book has been available.

Principles and practices of present-day insect control, including the drastic changes in spray solutions and application equipment occurring during the past decade, are included.

The chapters are arranged for quick, easy reference. The separate chapters on insects injurious to vegetable and greenhouse crops will be of particular value to vegetable growers.

Books on vegetable growing and allied subjects may be ordered through Readers' Service Department, AMERICAN VEGETABLE GROWER, Willoughby, Ohio. Enclose check or money order.

FOR SALE—REAL ESTATE

IF YOU ARE AN EXPERIENCED VEGETable grower and want a greater return for your efforts, in both income and healthy living, there is a sunny future for you in South Florida. We have available some of the finest farmland in the east coast, west coast or Everglades sections. You, like many successful growers, might find the soils and climate of South Florida to your liking. Wire or write HAROLD RABIN CO., INC., produce brokers and shippers, P. O. Box 7, Belle Glade, Florida.

HELP WANTED—MALE

SALESMAN OR SALES AGENT CALLING on Agricultural Trade in the following territory: Ohio, Michigan, Illinois, Wisconsin, Indiana, Pennsylvania, West Virginia and Kentucky. To sell a high grade line of fruit & vegetable containers and packaging supplies. Liberal commission basis. Send full particulars. Write Box 105, AMERIGAN VEGETABLE GROWER, Willoughby, Ohio.

MISCELLANEOUS

PEAFOWL, PHEASANTS, GUINEAS, BANtams, Waterfowl, thirty varieties Pigeons. JOHN HASS, Bettendorf, Iowa.

IRRIGATION. "PORT-ALUM" COUPLERS. Engineers have 8 years practical experience. "A Gentle Rain—Not a Cloudburst". Few dealerships open. In Ohio and nearby, write T. D. ROMIG, Carey, Ohio or "PAISO", Coshocton, Ohio.

NATURAL SOIL CONDITIONERS

ALL ORGANIC MATERIAL USED. ALL bags 24" x 40". Ready-made compost $3.00. Raw material $2.20. Ground corn cobs $1.60. 2-5 bags 10% off, 6-11 15%, 11 and more 20%. Write for more information. ORGANIC PROCESSING FARM & ORCHARDS, 1108 Beal Road, Mansfield, Ohio.

OPPORTUNITY ADS

Only 25c a word for one-time insertion; 20c a word for two-time insertion; 15c a word for four-time insertion—CASH WITH ORDER. Count each initial and whole number as one word. Copy must be in first of month preceding date of issue. ADDRESS AMERICAN VEGETABLE GROWER, Willoughby, Ohio.

FOR SALE—EQUIPMENT AND SUPPLIES

FOR SALE—ASPARAGUS TRIMMER AND conveyor, vegetable tyers. MANHATTAN GARDENS, Manhattan, Illinois.

4-ROW HARBISON-PAINE 'MILTON' PRECision planter with fertilizer attachment. GEO. DEVRIES FARMS, Evergreen Park, Illinois.

TWO LINK-BELT #230 ICE CRUSHER slingers. Both excellent condition. One with Hercules motor $600.00. Later model with Le Roi motor $750.00. LOBECO FARM, Lobeco, S. C.

FARMERS: DO YOU WANT A POTATO harvester which costs $1,190.00 on your two-row International digger or with alterations on any two-row digger? Harvests 500 bushels an hour into truck bulk-body. One man operator. No extra wheels. Will harvest potatoes, onions, beets, turnips, etc. Removes grass and vines. "U-MAK-IT." We furnish engineer's detailed working drawings, with specifications for assembly and 8 x 10 photo of harvester in field operation for $49.00 anywhere. Write C. H. WICKHAM, Mattituck, Long Island, New York.

ROADSIDE MARKET OPERATORS AND market gardeners, you can now wax your tomatoes, cucumbers, peppers, squash and other smooth skin vegetables with Johnson's WAX SHINE by hand, and command top demand and prices. Send $1.00 and will ship postpaid quantity that will wax more than a thousand pounds of produce. WAX SUPPLY CO., P.O. Box 304, Lombard, Illinois.

Watch for Important Directory Issue

Coming next month

OPPORTUNITY ADS

BUY, SELL AND TRADE—Readers and business firms will get top advertising value at low cost from AMERICAN VEGETABLE GROWER "Opportunity Ads." These classified ads are widely read, widely responded to by AMERICAN VEGETABLE GROWER'S high-income readers throughout America. Our classified advertising department will run your ad under any heading and will guarantee correct insertion.

RATES—For one insertion, 25c per word. For two insertions, 20c per word. Four insertions, 15c per word. Count each initial or whole number as one word. CASH WITH ORDER.

AMERICAN VEGETABLE GROWER reserves the right to reject or alter any copy which does not meet its standards. Ads will be inserted in first available issues unless preferred month is specified by advertiser. Closing date is first of month preceding publication.

USE THIS INSERTION FORM TODAY

Please insert my classified ad in your "Opportunity Ads" section as follows:

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AMERICAN VEGETABLE GROWER | WILLOUGHBY, OHIO

Water Is Essential

WHILE visiting vegetable growers in the southern states of Mississippi, Alabama, and Georgia recently we were impressed by the expanding use of supplemental irrigation. The predominant source of water appears to be farm ponds, with a few specially situated growers pumping from wells and streams. Most of this development has come within the past 10 years and appears to be expanding steadily. The very dry seasons of 1953 and 1954 made irrigation an essential to profitable vegetable production.

Our Gulf and Atlantic Coast states possess some of our best vegetable growing soils and are in addition favored by a temperate climate which permits two crops a year of many vegetables. There seems to be no limit to the possible production goals in this vast area. Experiments show that yields can be doubled and in some cases tripled through good production management. The capacity to produce is enormous, if you get the right combination of factors.

Water is one of those essential factors. John Campbell at the Mississippi Truck Crops Experiment Station at Crystal Springs in 1948 boosted tomato yields $157.50 per acre just by one application of an inch and a half of water on June 4. In looking over the weather records for the area Mr. Campbell discovered that in the 42 years from 1910 to 1952, a dry period occurred during every year, and in many there were two or more dry periods of fairly long duration. In each year supplemental irrigation would have paid well, and in many it would have been much greater than his 1948 returns.

While the recent drought years have shown the very great need for water at the right time, the more normal years have also shown the profitable use of additional water. Many successful vegetable growers look upon their irrigation system as an essential crop production practice—just as important as fertilization or cultivation. They have found that an adequate supply of water has made it possible to increase fertilizer used and shorten planting distances, for greater yields year in and year out.

Since water is one of the essentials to profitable vegetable production it appears that future producing areas or centers will be located where sufficient water is available for irrigation. We can already see a slight trend in this direction. If the prices of vegetables remain at a relatively low level, as they are now, this trend may be speeded up. However, the problem is a complex one involving a number of factors in addition to water, such as soil productivity, mechanical development, and improvement in marketing methods.

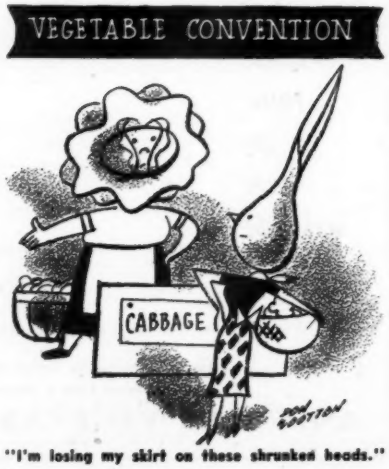
Pooling Our Interest

AS the age of technology advances upon us we see a need for greater and greater co-operation among vegetable growers. This co-operation takes on many forms. At the moment we are thinking of production and what we can gain by pooling our interests and resources in this field.

Sometimes when we visit a vegetable producing area we find a few growers who are doing a tremendously fine job of efficient production while a great many others perform at only moderate levels of efficiency. In still other areas there seems to be a general and consistently high level of efficient production.

It has been our observation that the reason areas with a uniform and high level of production efficiency are that way is because the growers all have a mutual bond of interest. They try things together. They have district, county, or local meetings frequently and attend them faithfully.

They realize that their problems are the same as their neighbors and that they really get ahead faster if they solve them together. This seems to be a healthy attitude and one we would recommend to those who have not tried it.



"I'm losing my skirt on these shrunken heads."

In Whiteside County, Illinois, the farmers got together with their extension agent to improve soil productivity and raise efficiency of crop production. Out of this came a series of soil clinics held each year at which time farmers present their problems and the extension service helps find the answers.

Over a period of eight years the farmers of this county have learned a lot about their soils, what's good and bad about them, and what to do to makes them more productive. Each farmer, as well as the extension service, has contributed something here for the benefit of every other farmer in his county. The result is a more productive agriculture on a sounder basis.

It is our belief that as we approach a period of decreasing farm population, at least percentage wise, and a period of stress upon agricultural economy we must work together more intensely.

We need not be afraid that if our neighbor finds how we grow a hundred bushels per acre he will put us out of business. History teaches us the opposite is true. When we give helpful information to another grower, we open the door for him to give us helpful information too.

Cabbage Juice for Ulcers

Cabbage juice will heal ulcers, says a team of Stanford University physicians in the January, 1956, issue of *California Medicine*.

Concentrated cabbage juice was administered to 26 San Quentin Prison inmates known to be suffering from peptic ulcers. They were hospitalized and carefully watched. Repeated x-ray examinations revealed that in 92% of the cases the ulcers were healed in three weeks.

The success of the cabbage juice treatment is based on recent evidence that ulcers may be a nutritional deficiency disease. The cabbage juice contains an anti-ulcer factor which physicians have termed vitamin U, each dose of which is derived from one quart of freshly pressed raw cabbage juice.

Coming Next Month

- Buyer's Guide for the Vegetable Farm
- Vegetable Areas of America —Long Island
- National Vegetable Week Plans
- Handy Tractor Carry-alls
- Ohio's Annual Greenhouse Day

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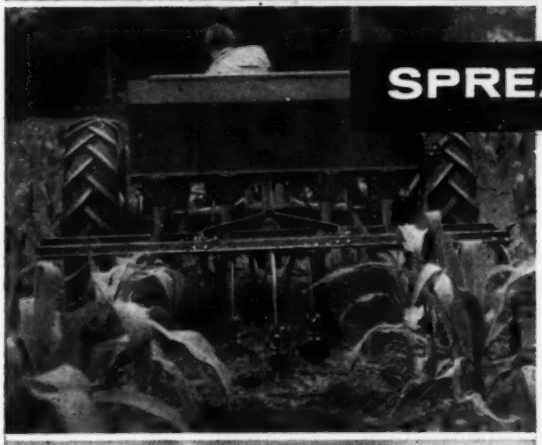

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Use "NuGreen" for top dressing or side dressing or plow it down to aid decomposition of crop wastes. It resists leaching, is held in the soil until the crop needs it. And there's less weight to handle. Each 80-lb. bag provides 36 lbs. of actual nitrogen.

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"NuGREEN" is the nitrogen you can count on whenever maturing crops need peak nourishment. "NuGreen" comes in free-flowing shot form—45% nitrogen, the most concentrated solid nitrogen available. For all crops . . . vegetables, fruits, grains, or pastures . . . "NuGreen" is the ideal supplemental nitrogen. See your dealer today for "NuGreen."

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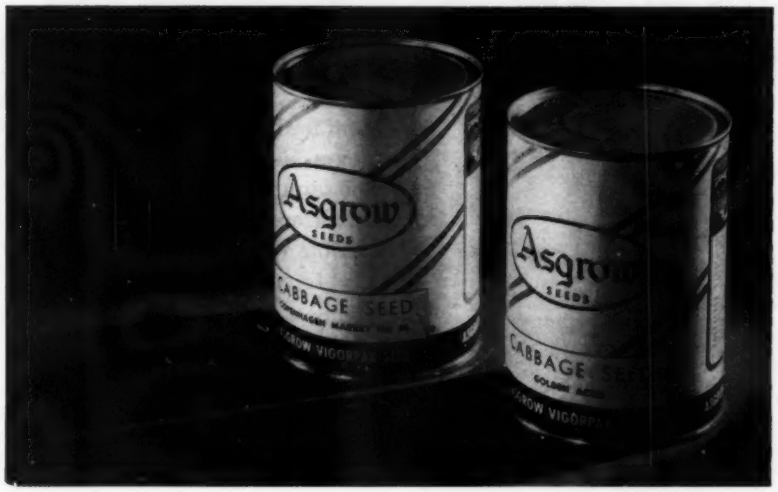

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